THE Chemical Age

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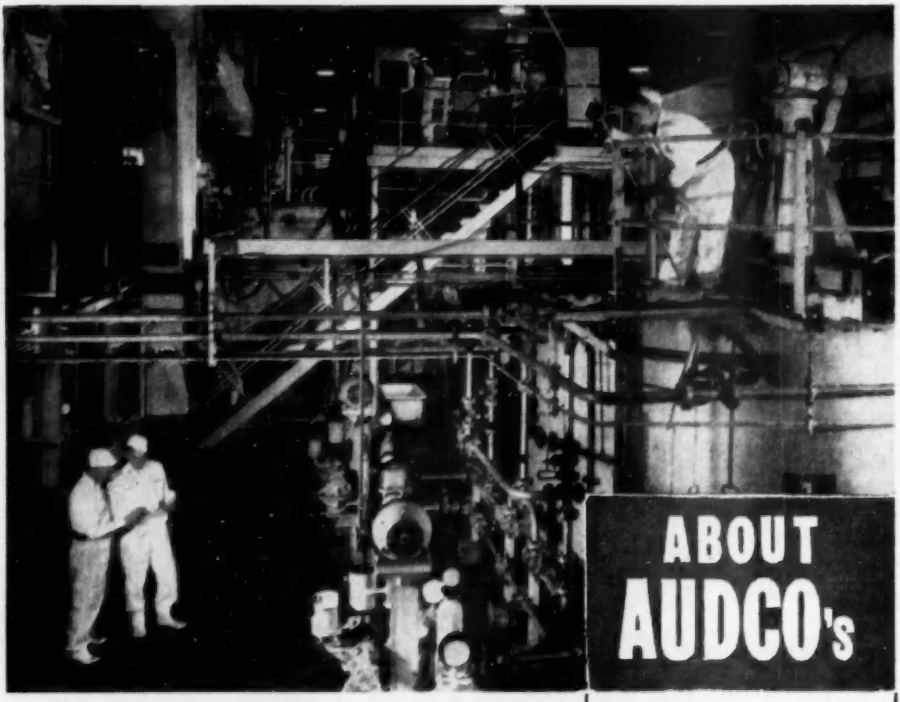

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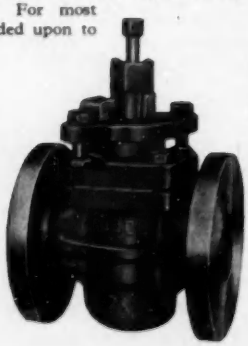

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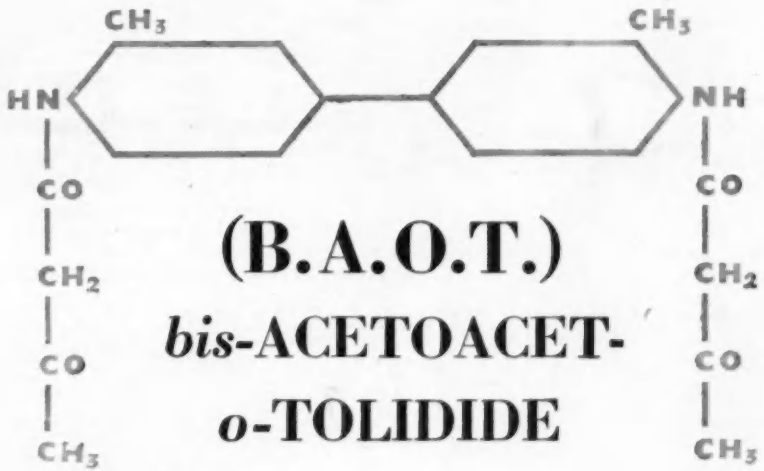

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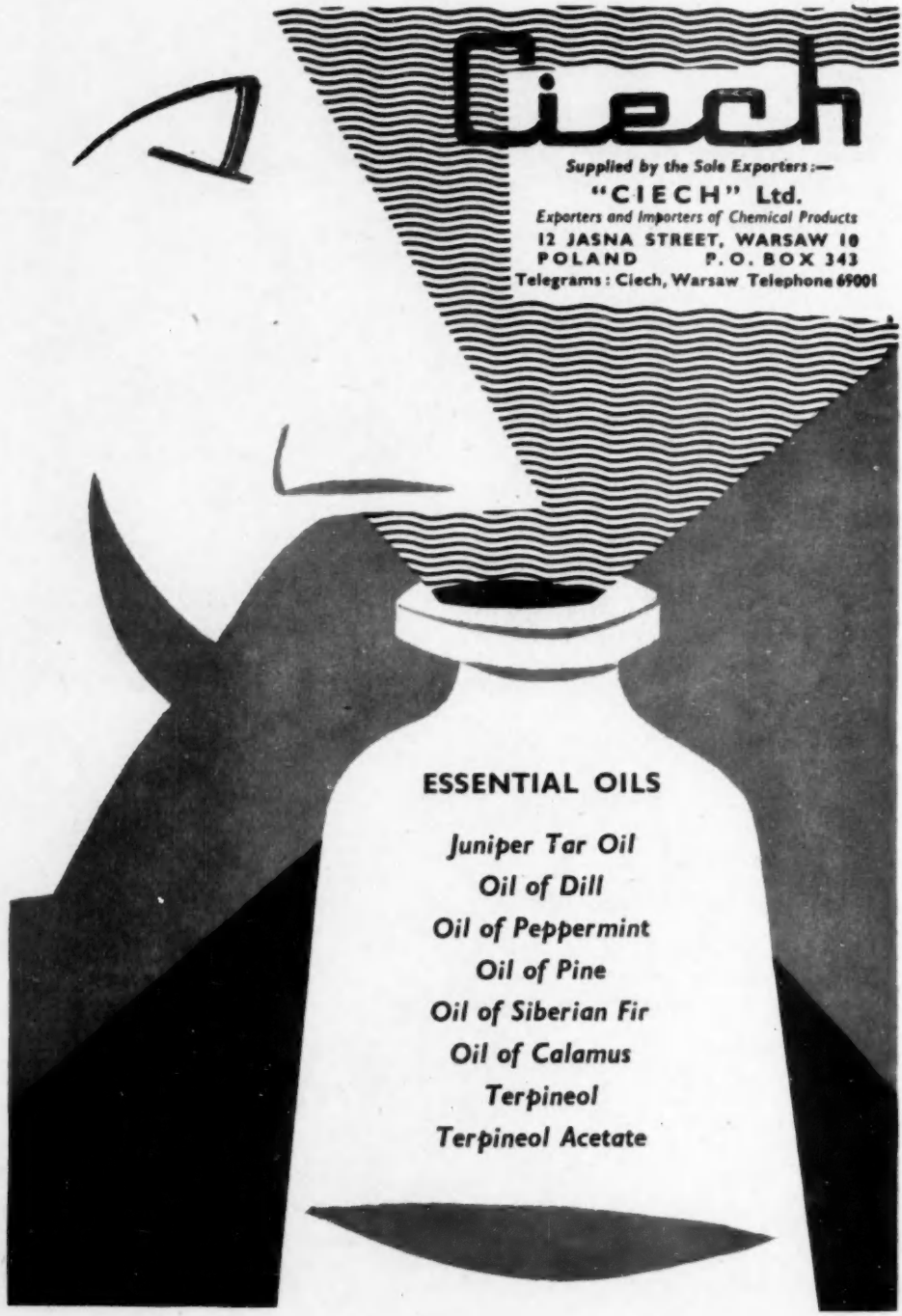
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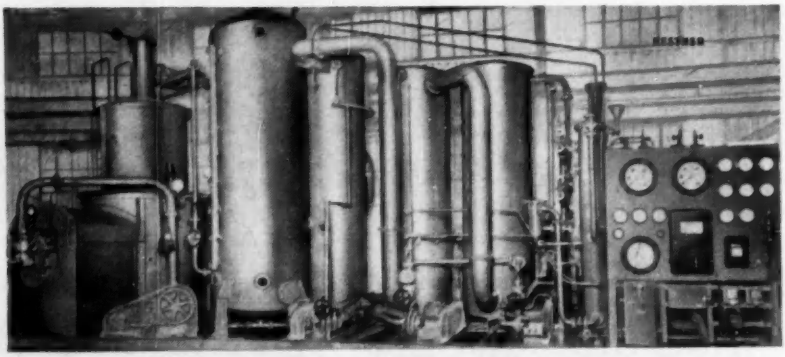

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CONTENTS . 26 NOVEMBER 1955

Chemistry & Crop Nutrition	1151
German Concern at US Competition	1153
Indian Newsletter	1155
Tube Investments Ltd., Chairman's Report	1157
Dyeing Acrylic Fibres	1158
The Ketjen Story	1159
BCIRA Annual Report	1160
The Chemist's Bookshelf	1161
Home News Items	1163
Overseas News Items	1164
Personal	1165
Publications & Announcements	1167
British Chemical Prices	1169
Law & Company News	1173
Chemical & Allied Stocks & Shares	1174
Next Week's Events	1175

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The Dollar Problem

OUR economic doldrums of 1955—we thus refrain from using the word 'crisis'—have been fairly generally described in official statements. There has not been a marked tendency to separate the balance of payments problem into its two parts—dollar accounts and 'other currencies' accounts. Previously when the payments gap has been causing Treasury alarm the dollar sector of the problem has been much more stressed. It is difficult to understand this. The problem is essentially and perpetually a problem of earning dollars. Sterling can weaken only in relation to the dollar; 'look after the dollars and the rest will look after itself' is a good modern proverb for trading Europe.

Like any person or business with a non-balancing buying and spending budget, the UK can choose between contraction and expansion, between buying less or earning more. It is trite to say that our standard of living rests upon a large annual volume of imports; and among our vital import needs are a number of materials and foods which we must mainly obtain from dollar areas. Freedom for importing all goods from these areas has long had to be restricted to ensure that dollars are in fact spent upon essentials. Have these controls—for they are controls whether the Government likes the word or not—been too lightly imposed? That is not a pointless question when one considers a recent Board of Trade statement that dollar imports in the first nine months of 1955 were 40 per cent greater in value than during the same period of 1954. Commercial expansions or contractions rarely display such huge changes—gains or losses of 10 or 15 per cent are more normal.

There are various causes for this 40 per cent rise in dollar expenditure. Shortages of home-produced steel and coal have necessitated imports of dollar-bought steel and coal. Some of our normal imports have risen in price. Feedingstuffs for farm animals were decontrolled and this, coupled with a bad harvest in 1954, led to very big dollar purchases, especially for cereals. From this brief listing of causes it is clear that greater home production of materials we can produce here would have obviated any dollar payment gap of sizeable seriousness. Even the admittedly bad weather of 1954 was not by any means the whole reason for raising dollar feedingstuffs imports. Throughout that wet season grass grew superbly and our huge grassland acreage is utilized much less efficiently than grassland in Holland or Denmark—we do not have to buy fertilizer materials from dollar areas even though we must import most of our phosphate and potash, and turning fertilizers into more food via grassland is not by any means modern technological knowledge. The shortage of steel is perhaps understandable. Industry is booming and every plant expansion or plant repair calls for steel; if we do not import extra steel, important industrial expansions are held up. Furthermore, the steel industry has passed through a long period of political uncertainty, and this can hardly have encouraged its fullest possible expansion. Coal? Who knows the answer to this problem of producing more coal from our mines?

At least it can be argued that we should be able to reduce our total dollar bill, that some of this 40 per cent surge in 1955 can be suppressed in 1956 and

onwards. To hope that we can increase dollar exports to earn the equivalent of this 40 per cent is too much. Trade, as we have just said, does not usually change by such large amounts—even the stoutest sales-promotional schemes do well if they lead to annual gains of 5 or 10 per cent. To say this is not to preach apathy in regard to dollar exports expansion, but merely to put this part of the curative process into its realistic perspective.

Our exports to the US in the first nine months of 1955 were 19 per cent higher than in the similar period of 1954. This is better than we might expect, especially when the resistance of US industry to imports is taken into consideration. Our exports story for Canada is much less flattering. By 1953 exports had risen by 25 per cent in four years, but there has been a fall in both 1954 and 1955; and all the time our share in Canada's import trade as a whole has been declining. There are 13 Latin-American dollar countries—and we supply only 5 per cent of their total imports, a lower proportion than before the war. Both of Canada and this group of South American countries the same can be said—the lion's share of export sales is obtained by the United States. Our geographical position may not be as favourable, but if many of our goods can sell in the United States—and sometimes to the point of provoking demands for higher tariffs—they should be able to compete with American goods in these non-US markets. There is reasonable evidence, therefore, that we are missing dollar-export sales both north and south of the US borders. In the earlier post-war years, when all producers of goods could choose their markets, did we over-cultivate US opportunities and neglect these others?

Another viewpoint is to compare our effort with that of Germany. In the last four years Germany has been obtaining 3.2, 4.3, 5.3 and 5.7 per cent of Latin America's total dollar trade with other countries. Our own percentage has remained almost unchanged at 4.6 or 4.5 per cent. In Canada's total import trade, the share of Germany has risen from 0.5 to 1.3 per cent in four years, a small share but nevertheless a rising one. Our share has been fluctuating as follows: 8.9, 10.3, 9.6, 8.3 per cent. It is difficult not to reach the conclusion that in these countries the German sales effort is more persistent; it may in the case of Canada represent an effort that outweighs the amount of business so far gained, but it remains to be seen whether that slender share of only 1.3 per cent still steadily expands. Do we expect trade from these non-US dollar countries to come to us? Or, put another way, do we sufficiently take our goods to them? Do we with Canada rely excessively upon her place in the Commonwealth to induce her to buy British goods? There is indeed a bond, but it should not substitute for the basic elements of commerce—market study, salesmanship, prompt quotations, reasonable delivery dates, suitable provision for maintenance, replacements and technical information etc. How many British firms have really made sufficient effort to capture a portion of this extremely important and rapidly developing market? How many are content to leave the dollar markets for others to concentrate on easier but, from the national viewpoint, far less important markets?

The total import trade of the dollar countries is about $18,500,000,000 in annual value, or nearly 1½ times the equivalent sterling of the total UK national budget. This perhaps strikes a small-sounding note since US imports are included, but it must be remembered that US import needs are fairly small per head because she is so self-sufficient for vital raw materials. When it is considered that our own shares in this total trade, country by country, amount to small percentage figures, seldom reaching even 10 per cent and then only for Canada, the relation between our own budget problems and opportunities for dollar exports is brought out very strikingly. One per cent more of this trade would be $185,000,000 or, roughly, £65,000,000. This can be compared with the 40 per cent jump in our dollar imports for January-June this year, a jump of £188,000,000. To balance the whole of this, we would need to gain 3 per cent more of the total dollar-area's import trade. One and one-half per cent would probably be the most reasonably expectable contribution—the rest should be balanced by economy in our own dollar imports.

Notes & Comments

Low Pressure Polythene

INTEREST in low pressure polythene continues at a high level and it is extremely difficult to keep track of latest developments. One thing is certain, however, and that is that we in this country are lagging well behind the rest of the world. The latest news comes from France and is that no fewer than five French firms have recently purchased licences for the manufacture of the low pressure polymers. Three of these—Kuhlmann, Saint-Gobain and Rhone-Poulenc—are said to have jointly purchased a licence from the Phillips Petroleum Company of the US for their process and individually to have acquired licences for the German (Karl Ziegler) process. Two other important French companies—Pechiney and National Mines—are said to have individually purchased Ziegler rights. All over the world chemical manufacturers are making deals with either the German or American interests.

UK Rumours Flying

THE picture in the UK is much different, for not a single British company has publicly announced any interest in low pressure polythene, although the veil of secrecy has given rise to countless rumours. The first of these to come to our notice a few weeks ago was that Imperial Chemical Industries Ltd.—the discoverer of polythene—had purchased the exclusive UK rights for the Ziegler process. In view of the fact that these rights belong to Petrochemicals Ltd. (which was recently acquired by Shell) and that ICI have been working on low pressure polythene for a very long time and have taken out some patents themselves, this seemed absurd. Later, the story was being spread that ICI were negotiating with Phillips. Now both rumours have been denied by a high ranking ICI executive. What remains to be explained, however, is what the company plan to do with their own patents and whether these cover an industrial process which ICI will utilize. ICI's patents on high pressure polythene expire in the spring of 1956.

British Firm Negotiating

WHERE there's smoke there's fire, and two rumours now being circulated have undoubtedly some truth behind them. The first of these is that Petrochemicals Ltd. (or Shell) are now investigating possibilities for starting production of the Ziegler product. It is said that experts have studied the product and are now considering the economical and engineering questions involved. Another rumour is that a British company is at the moment negotiating with Phillips for a licence and it is expected that an announcement will be made shortly. At the moment we have nothing but rumours to go on, but it is widely believed that when the announcement comes it will come from The Distillers Company or British Petroleum, unless it is a joint announcement. With practically every major plastics company (as well as several newcomers) in America and Europe showing intense interest in low pressure polythene, surely it is reasonable to expect at least one British company to announce their intentions soon. A statement from ICI regarding the vast amount of research they have done would be particularly welcome. If they and the other British companies lack faith in the low pressure product or the processes at the moment available they should say so. The users of British plastics have every right to know what is going on.

Coal Hydrogenation

WATCH America regarding coal hydrogenation. In particular, watch the Union Carbide and Carbon Corporation. This may be a tip as speculative as any hunch about horses, but what was recently revealed by a vice-president of the company, Mr. J. G. Davidson—when receiving the Chemical Industry Medal of the Society of Chemical Industry's US Section—is good evidence of form and training. The American approach to coal hydrogenation has differed from the

approach here or in Germany. Conversion into petrol or fuel oils is not a sensible target there; natural sources of light and heavy oils must almost certainly remain cheaper. The US approach has had to be 'less drastic' so that the coal 'macro-molecule' breaks up into large units rather than small ones, into the xylene family and the phenols, etc., not into methane and benzene, etc. Mr. Davidson indicated that the problems mainly encountered had been mechanical rather than chemical. Plant changes have been costly and numerous. Pressure and temperature ranges have been from 3,000 to 10,000 lb. and 400 to 700° C. The view has apparently been reached that the minimum economic size of a plant is one to handle 1,000 tons of coal per day. Mr. Davidson quoted an old saying, 'Seven years from test-tube to tank-car'. In this case the period of patient investment and development seems likely to be three times as long. Union Carbide and Carbon have already been working on coal hydrogenation for 19 years and it still needs another year or two before the processing problems are finally solved. Then 'a whole series of new aromatic compounds, new in the sense that they are not presently available in large quantities at reasonable prices . . .' will be brought on to the US market.

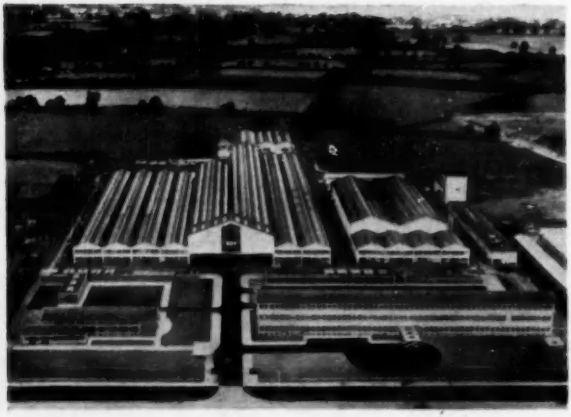
Exhibition Brochure

THE Oil & Colour Chemists' Association is preparing a detailed brochure of the Eighth Technical Exhibition to be held at the Royal Horticultural Society's New Hall, Grey Coat & Elverton Streets, London SW1, from 20 to 22 March, next year. It will contain information about the 82 companies and research associations who will have stand space at the exhibition, a plan of the hall and the facilities, and an application form for tickets for the luncheon at the Criterion Restaurant, Piccadilly, which precedes the opening ceremony of the exhibition by the Rt. Hon. Viscount Waverley, P.C., G.C.B., G.C.S.I., G.S.I.E., F.R.S.

Brochures will be sent to all members of the Oil & Colour Chemists' Association during December and January. Non-members wishing to have a copy of the brochure, which is free, should write to: Mr. R. H. Hamlin, M.A., general secretary, Oil & Colour Chemists' Association, Memorial Hall, Farringdon Hall, London EC4.

Training German Atomic Engineers

Atomic engineers are to be trained at the Technische Hochschule at Aachen in the winter term which has just commenced. Announcing this recently, Professor Wilhelm Fuchs, director of the physics institute at the Aachen school, said that German industry must be enabled to take its place in 'the atomic business'. The essential theoretical studies were available and the professors and staff at Aachen had already secured the practical acquaintance with the working of atomic plants abroad which they needed to start teaching.



The new works of the APV Co. Ltd., at Crawley, Sussex. The final stage in the transfer from London and Slough will be completed towards the end of December (see our issue of last week, p. 114)

Chemistry & Crop Nutrition

Dalton Lecture on Importance of Fertilization

THE ninth Dalton Lecture was given in Manchester on 28 October by Sir William Ogg, M.A., Ph.D., LL.D., director of Rothamsted Experimental Station. Sir William chose as his subject 'Chemistry and Crop Nutrition.' The lecture and the accompanying exhibition and film show were organized by the Manchester and District Section of the Royal Institute of Chemistry.

The exhibition, which lasted two days, was entitled 'Chemistry and Agriculture' and was planned to illustrate the many diverse benefits given to agriculture by modern chemistry. The exhibitors included Fisons Ltd., May & Baker Ltd., Monsanto Chemicals Ltd., the National Agricultural Executive, Rothamsted Experimental Station and the Universities of Bristol, Leeds and Nottingham. Films were loaned by the Australian Wool Secretariat, Imperial Chemical Industries Ltd., The Mond Nickel Co. and Shell Ltd.

John Dalton, in whose memory these lectures are given, made many valuable contributions to meteorology, and produced the first clear ideas about the nature of the evaporative process, and modern work on this rests securely on the foundation he laid.

The following is a short summary of Sir William Ogg's lecture:—

Every bite of food we eat and practically every stitch of clothing we wear takes plant food out of the soil in addition to the large amounts lost by erosion or washed out of the reach of plants by rain.

Soil Fertility

When populations were small, and agricultural methods primitive, nature could make good the losses; rain, sun and frost break down rock particles, plants and animals die and gradually decompose the rock particles still further, earthworms and other factors play their part and fresh plant nutrients are formed. Maintenance of soil fertility was no problem then, but to-day nature cannot replace the losses rapidly enough; our vast populations, at least those enjoying modern sanitation, return practically nothing to the land, and enormous amounts of plant nutrients leave the soil at every harvest. Man must increase soil productivity himself and maintain it at a high level. This is a problem for scientists, and to quite a large extent for chemists, and scientists have contributed largely to the 55 per cent increase in food production in Britain since 1939, while fertilizer consumption on the farms has trebled.

Scientific Knowledge

Scientific knowledge on this problem started with de Saussure, Boussingault and Liebig on the continent and Lawes and Gilbert in Rothamsted 100 to 150 years ago. They and their successors vastly increased our knowledge of the requirements of crop plants, and of soils and how plants take up nutrients from them, also of the production of fertilizers to supplement nature's efforts. Critical points in the development of fertilizers were the discovery by Lawes, about 100 years ago, that rock phosphate treated with sulphuric acid gave a valuable fertilizer, superphosphate, the beginning of the mining of potash deposits in 1861 and the discovery, 40-50 years ago, of how to combine the nitrogen of the air with the hydrogen of water, forming ammonia. To-day, to take nitrogen alone, British farmers apply annually £20,000,000 worth of nitrogen fertilizer to their crops.

These fertilizers are vital, now that the supply of the older manures is quite inadequate. There is no scientific basis for assertions that fertilizers injure the soil and the health of crops, animals and human beings. The ills sometimes attributed to fertilizers existed before fertilizers were discovered, and are rife where they have never been used.

Other important plant nutrients include calcium, magnesium and sulphur, and also the 'trace elements' such as copper, zinc, boron, molybdenum, etc. Only a few ounces of these trace elements are needed for each acre of crop. Some soils cannot supply even a few ounces and produce very poor crops, e.g. large areas of South Australia which were once worthless have been made fertile by adding half an ounce per acre of molybdenum (see THE CHEMICAL AGE, 1955, **73**, 993). Excess of certain

elements can be harmful; for instance, on some pastures, livestock suffer from a scouring disease, 'teart,' due to an excess of molybdenum in the soil and consequently in the pasture.

An important aspect of the chemist's work is to determine how much of the various plant nutrients in the soil is present in a form available to a growing crop. With phosphorus and potash, for example, this is done by extracting the soil with dilute acids; the amount of nutrient extracted from the soil is related, although in a complex way, to the amount of nutrient which plants can absorb from the soil. Such tests are done and interpreted by agricultural advisory services, and provide a useful guide to farmers in liming and fertilizing.

The clay and humus of the soil play leading roles in crop nutrition. Plant nutrients are stored in them, and the ease or difficulty of cultivating the soil depend on them. Much work is being done on them, identifying their chemical constituents and determining the amounts present, discovering the mechanisms by which they play their part and how to use their favourable properties; also how to limit the unfavourable properties of clay and humus, such as that of holding on so strongly to various plant nutrients that plants cannot extract them. In average conditions, only 20 to 25 per cent of the phosphates applied to a soil is recovered by crops in the first year or two after application. These fixed nutrients become very slowly available; barley crops at Rothamsted are still responding markedly to phosphates applied over 50 years ago.

Chemistry has greatly contributed to the understanding of these and many other problems of crop nutrition and will, as populations increase, have an even more important part to play in feeding a hungry world.

Atomic Information

ONE of the methods used by the UKAEA to make unclassified atomic energy information as widely available as possible is to apply unclassified documents to certain libraries which are designated depository libraries. Until recently there were only two such libraries in the UK, the Science Museum Library in London and the Sheffield Central Library. To provide for the increasing demand for the documents, particularly from industry, the following are now included in the depository library scheme: The Central Library, Birmingham, The Mitchell Library, Glasgow, The Central Library, Liverpool, The Central Library, Manchester, and The Central Library, Newcastle.

Documents deposited in these libraries are freely available to the public, and the libraries have agreed to supply photostat copies at their usual rates on request. The documents are also sent to the Copyright Libraries and to the Patent Office Library, and some of them are on sale through HMSO.

Ski-ing on PTFE

STUDIES have been made of the behaviour of some new plastics materials on snow and ice. Several pairs of skis have been constructed with coatings of polytetrafluoroethylene and tested on runs in the Alps says an article by F. P. Bowden in *Nature* (1955, **176**, 946). Under the conditions of test it appears clear that skis made of ptfe are considerably faster than skis made from other materials.

There is evidence, says the article, that the frictional behaviour of materials on snow is influenced by the contact angle which the water film makes with the surface. With ptfe this angle is very high (126°) and remains high even after prolonged sliding on snow. This is appreciably higher than the contact angle observed on waxed surfaces that have been on snow.

This material should have useful applications not only for ski-ing but for sledging and for aircraft landing, particularly in very cold, very wet or difficult ice and snow.

Burmese Visitors

During a visit to Evans Medical Supplies Ltd.'s headquarters at Speke, Liverpool, on 17 November, His Excellency, U. Kyin, O.B.E., the Burmese Ambassador, and a secretary, U Tin Lat, met eight Burmese students who are training for positions in the Burma pharmaceutical industry. The visitors were conducted on their tour by Mr. Ian Ferguson, chairman and managing director, Dr. F. S. Gorrill, deputy managing director, and Mr. W. J. Merrick, public relations officer.

German Concern at US Competition

New Uses for Fischer-Tropsch Plant

LOWER prices for most chemical manufactures in the Federal Republic this year have so far been offset by slight upward adjustments for basic inorganic chemicals, leaving the general price level for chemicals unchanged according to official calculations; there has been virtually no change in the price level of basic organic chemicals while special-purpose products declined by several points. It appears that the lower prices have so far been mostly counterbalanced by lower producing costs although the demand for higher wages in the steel and certain other industries is likely to lead to fresh wage demands in the chemical trades early next year.

German chemical exporters are feeling concern at the evidence of increased competition in American and OEEC countries. Chemical exports in August were 10 per cent below July. While some decline was only to be expected in the holiday month, the fall was more pronounced than in most other export groups. Progressive liberalization and easing of restrictions on dollar imports has enabled US exporters to compete more effectively in OEEC markets which are of particular importance to German exporters. German chemical exporters also complain that the limited convertibility of export proceeds conceded in the latest trade agreements operates to their disadvantage; not only did it not help to expand German exports but the chemical trade with Brazil, for instance, had been adversely affected by the change from the previous bilateral arrangement.

Sales Up 20 per cent

Badische Anilin- und Soda-Fabrik AG states in a recent prospectus that sales in the first eight months of this year were about 20 per cent higher than in the corresponding period of 1954; in spite of declining prices in some sections an 'adequate' profit is likely to be earned this year. The prospectus contains a few interesting figures about the works at Ludwigshafen, the largest single chemical works in Europe. The total works area extends over 1,300 acres of which one-fifth is covered by buildings. There are 34 miles of roads, 400 miles of pipelines, 500 miles of underground cables and 125 miles of standard-gauge railway lines inside the works area.

The daily consumption of coal and coke amounts to 3,500 tons. Electricity consumption last year was of the magnitude of 2,000,000,000 KWH. Average steam production is 900 tons an hour. Some 1,400,000 cubic metres of water for cooling are used on an average day, and the daily consumption of coke-oven gas exceeds 400,000 cubic metres. Over 20,000 tons are moved every day, half by rail and a quarter each by water and road.

Safeguarding Raw Materials

In view of the rapid increase in production, the BASF board states, special importance attaches to safeguarding the supply of raw materials. Most of the coal and coke required is obtained from the company's own coal mining company. Ample electricity supplies are assured under long-term contract with the Rhenisch-Westphalian Electricity Works. Coke-oven gas for the production of ammonia is obtained from the Saar gas grid and BASF's own resources, and natural gas supplies—now at a daily rate of 144,000 cubic metres—have been obtained from Gewerkschaft Elwerath under the 1954 agreement.

Rock salt and limestone are obtained from natural deposits favourably placed for transport to Ludwigshafen. Pyrites for sulphuric acid production are supplied by the copper smelter at Duisburg under special contract. Phthalic acid needs will be covered by the 12,000 ton plant erected at Bochum in conjunction with Gelsenkirchener Bergwerks-AG. Ethylene oxide, used for making Glysantin and glycol, is supplied by Chemische Fabrik Holten GmbH in which BASF has a large minority interest. Ethyl benzol is now available from Rheinische Olefinwerke GmbH, Wesseling, in which BASF co-operates with Deutsche Shell AG.

As the Fischer-Tropsch process is uneconomical under present conditions, the plants erected in Western Germany for this process before the war are now used for other purposes. Ruhrchemie AG this month opened an oil refinery built on the site of the former F-T plant; the company will re-

fine Kuwait crude obtained under long-term contract from Gulf Oil Corporation at the rate of 280,000 tons a year. The plant includes a Perco desulphurization installation and a TCC cracking unit. Ruhrchemie AG is reported to be considering the chemical utilization of certain hydrocarbons.

The Fischer-Tropsch plant of Krupp Kohlechemie GmbH was handed over early last year to Steinkohlenbergwerk Hannover-Hanibal AG for the erection of a synthetic ammonia plant. This plant which is expected to cost DM.21,000,000 will produce 42,000 tons of nitrogen annually of which 26,000 tons will be processed into ammonium sulphate and the remainder is to be sold, chiefly for the manufacture of nitric acid. Operations at the plant which is situated at Wanne-Eickel are scheduled to start in April 1957.

Gewerkschaft Victor which operated a Fischer-Tropsch plant in conjunction with a nitrogen plant at Castrop-Rauxel concentrated the war damage repairs on the nitrogen works which have been extended since to an annual capacity exceeding 100,000 tons; most of the primary nitrogen is used for making various compound fertilizers while a small part of the output is disposed of in the form of liquid ammonia.

Leipzig Fair, 1956

Impressive British Display Expected

THE Leipzig Fair, now held twice a year, will take place next year from 26 February to 8 March and from 2-9 September. The spring fair will feature both technical and consumer goods, while the autumn fair will concentrate on consumer goods, with a large section devoted to technical consumer goods.

At the 1956 spring fair, Austria, Finland and Uruguay will exhibit officially for the first time, while the space occupied by India will be three times greater than last year. Collective displays from Great Britain, Belgium and France are being planned, while negotiations with Yugoslavia, Colombia and other countries are reported to be proceeding favourably.

A total of 22,000 sq. ft. of covered and outdoor space has been made available for British firms. Already this space has been over-booked and the British collective display, which has been a feature of the last two fairs, promises to be the most impressive yet held. Leading chemical manufacturers, textile firms, makers of diesel engines, generators and other engineering products will be showing either in the collective display or the appropriate trade group.

Herr Kurt Friedrich, director of the Chamber of Foreign Trade of the German Democratic Republic, and Herr Emil Senftleben, director of the Foreign Department of the Leipzig Fair Administration, who are at present in Britain to publicize the fair and meet exhibitors and buyers, announced at a Press conference in London last week details of the products that the German Democratic Republic wants to buy and sell.

The foreign trade companies of the German Democratic Republic are willing to buy from Britain metals and iron and steel products, chemicals, vegetable and animal oils etc. Items they are prepared to sell include chemicals, fertilizers, cement, technical and medical glass, optical and precision engineering products, testing and measuring apparatus etc.

Sodium Chlorate Plant

TO meet the demand for sodium chlorate as a source of chlorine dioxide in the expanding paper and pulp industry in British Columbia, the Electric Reduction Co. of Canada Ltd., an associated company of Albright & Wilson Ltd., of London, is to begin work immediately on the construction of a $5,000,000 sodium chlorate plant on the northern shore of the Burrard Inlet, Vancouver. This location will permit distribution by barge and boat.

For many years the main uses of sodium chlorate have been in metal treatment and weed control, but in the last 10 years it has been in increasing demand as a source of chlorine dioxide for bleaching wood pulp.

Electric Reduction Co. of Canada, founded in 1898, has no chemical plants on the west coast. It began operations producing phosphorus at Buckingham, Quebec, developing the plant to produce chlorates, phosphoric acid, phosphorus sesquisulphide and other phosphorus-containing compounds. Recently the company completed a $5,000,000 plant for producing phosphorus at Varennes, Quebec.

Indian Newsletter

FROM OUR OWN CORRESPONDENT

INDUSTRIAL production in India during the second quarter of 1955 registered a slight increase as compared with the previous quarter and was considerably higher than the output during the corresponding period of last year, according to an official survey. During the quarter 100 licences were issued under the Industries (Development and Regulation) Act of 1951. Of these 27 were for the establishment of new units, 49 for effecting substantial expansion, five for the manufacture of new articles, three for shifting of units and the rest for carrying on the business of existing undertakings. In particular the production of chemicals like caustic soda and ammonium sulphate reached higher levels during the quarter as compared with the corresponding period of last year. The production of soda ash increased by nearly 62 per cent largely due to an increase in the capacity of one of the units. The production of superphosphate was however much lower due to accumulation of stocks at manufacturing centres. The break up for the chemical industries is as follows:—

	1954	*Jan.-June* 1955
Sulphuric acid (thousand tons) ..	150.9	77.8
Superphosphate (thousand tons) ..	105.1	33.2
Ammonium sulphate (thousand tons)	340.2	159.6
Soda ash (thousand tons)	48.3	37.7
Salt (thousand maunds)	*73,908	†63,609
Copper sulphate (tons)	840	469
Bleaching powder (tons)	2,926	1,078
Liquid chlorine (tons)	9,782	3,970
Bichromates (tons)	3,239	1,302
Glycerine, refined (tons)	2,388	1,084
Rayon, viscose (tons)	4,944	2,752
Laboratory glassware (tons) ..	1,512	595
Cement (million tons)	4.4	2.21
Coal (million tons)	36.8	19.2
Steel, finished (thousand tons) ..	1,234	633

* 1953-54.
† Nov. 1954-April 1955.

It may, perhaps, be remarked that during the first half of the current year the world's total industrial output was nearly equal to that for the whole of 1937 and was higher than that for 1938, according to statistics released by the United Nations. Industrial production was higher by nine per cent than that for the corresponding period of 1954.

* * *

The Union Minister for Food and Agriculture of the Government of India said recently that the Government propose to set up three fertilizer factories in Nangal, Bombay and Vijayawada. While it has been known for some time that an integrated fertilizer-cum-heavy-water plant would come up in Nangal, the announcement in respect of the other two units has been made now for the first time. At a conference of the representatives of the Central and State Governments and the Trade, the Minister stated that India would be consuming 1,850,000 tons of sulphate of ammonia by the end of the Second Five Year Plan period as against 650,000 tons during 1955-56. The conference considered measures for increasing the consumption of superphosphates and nitrogenous fertilizers in the country as also the setting up of a superphosphate pool, the details of which would be worked out shortly.

It might be of interest in this connection to note that, according to the latest annual report of the board of directors of the Sindri Fertiliser Factory, the production of ammonium sulphate during the year rose from 249,953 tons in 1953-54 to 299,983 tons. The despatches of fertilizers during the year were also larger. Owing to a substantial increase in production it has been possible to reduce the price from Rs.250 per ton (£16 approx.) to Rs.270 per ton (£20 approx.). The gross profits of the premier State owned concern for the year amounted to nearly Rs.39,600,000 (£2,970,000) which is about a third higher than that of the previous year. Mention may also be made of the fact that Sindri repaid Rs.16,700,000 towards the loan from the Government and financed from its own resources the coke oven project estimated to cost Rs.28,100,000.

* * *

A new factory of Carborundum Universal Ltd., an Indo-British-American venture, to manufacture bonded and coated abrasives and one of the biggest industrial undertakings in India, was declared open recently in Madras. The Carborundum Company, Niagara Falls, and the Universal Grinding Wheel Company, of Stafford, England, have joined the Indian concern of Murugappa & Sons to form the Carborundum Universal Ltd. The foreign firms have subscribed 49 per cent of the capital while the Indian firms has contributed the rest. The factory is situated on a 27 acre plot near Madras and

is equipped with the most up-to-date machinery. It is manned by foreign experts and Indian personnel trained abroad. The range of bonded abrasives produced include grinding wheels, rubbing bricks and sticks, sharpening stones and valve grinding compounds. In the category of coated abrasives are flint, garnet, emery, aloxite, silicon carbide, rolls, belts, discs and reamstock in paper and cloth. The company hopes to meet the growing demand for manufactured abrasives due to the rapid industrialization of the country. The annual target at present is 230 tons of bonded abrasives which would gradually be stepped up to 300 and ultimately to 600 tons.

* * *

A five member committee has been constituted by the Ministry of Commerce and Industry of the Government of India, to assess the scope for increasing the production of alcohol in the country and to examine ways and means of full utilization of the total production of alcohol either as power alcohol or more particularly for industrial purposes. The Chief Industrial Adviser to the Government of India in the Ministry of Commerce and Industry, Dr. A. Nagaraja Rao, will be the chairman and the committee has been asked to turn in a report in six months' time. It may be pertinent to point out here that the power alcohol industry witnessed a set back in 1953-54. The production was 4,640,000 gal. in that year as against 7,880,000 gal. in the previous year, though the installed capacity lies around 15,000,000 gal. The chief factor ascribed for the fall in production has been a shortage of molasses. However the present production of alcohol in India is being largely used as power alcohol for automobile fuel in admixture with petrol. With the expansion of the sugar industry the potentiality for the production of alcohol is on the increase and it is felt desirable that the many industrial uses to which alcohol can be put should be developed so as to manufacture diverse products. The committee will also suggest suitable locations for new units for producing alcohol.

* * *

A committee of experts has been constituted by the Government of India to draw up a plan for the development of the aluminium industry in the country. The committee will examine possible sites for additional reduction units, having regard to the availability of bauxite, power and other facilities. The committee is composed of representatives of the Government and the trade.

Bamboo from Peat Soil

AN important experiment in the development of a British source of cellulose for the manufacture of rayon is being carried out in a remote part of Galloway, South Scotland (see THE CHEMICAL AGE, 1955, **73**, 287). Here a small area of peat bog on the estate of Mr. Lowdon McNeill, Corrybracken, near Kirkcowan, has been acquired by the British Rayon Research Association for the production of bamboo, one of the basic materials. A final planting is to be made next spring, and if the experiment is successful it is proposed to approach the Agricultural Research Council on the matter.

In the Logans Moss area, about 12 miles from Stranraer, a small area was planted in Bamboo last Easter. The sets are growing in peat under favourable conditions. The problem, however, is to find 50,000 acres of land unsuitable either for rearing sheep or growing trees within 50 miles of a tidal estuary, and to find a plant with a high alpha cellulose content which will flourish on that land.

The British Rayon Research Association think they have found the key to a solution. There are 50,000 acres of peat moss in Galloway, much of it in the central area of the province within easy access of Newton Stewart. Bamboo has the necessary alpha cellulose content, but although experts were of the opinion that it would not grow in peat 50 plants were planted in Logans Moss and are flourishing. It is now proposed to put 5,000 sets in the peat moss on part of Mr. McNeill's estate near Barrhill.

Hannover Fair 1956

Chemical engineering and chemical manufactures will be grouped according to industry and not by nationality at the German Industries Fair at Hannover from 29 April to 8 May next year. In the past the British chemical industry has shown little interest in exhibiting at Hannover, reports Schenkers Ltd., shipping agents of 27 Chancery Lane, London WC2, the official UK agents for the fair, who will supply details and costs of participation.

Tube Investments Ltd.

Chairman's Report Issued to Shareholders

THE annual general meeting of Tube Investments Ltd. will be held at the Midland Hotel, Birmingham, on 12 December. In his annual review released to shareholders on 18 November, Sir Ivan A. R. Stedeford, K.B.E., the chairman, opened by expressing appreciation of their confidence in the proposal to raise the company's capital. To finance modernization, development and research, £8,150,000 was needed.

Discussing the new industrial age, Sir Ivan said it constituted a three-fold attack on traditional industrial practice, each line of attack being as significant as the introduction of the steam engine or the factory system were 200 years ago.

Synthetic Materials

The first line of advance was the development of synthetic materials to replace and supplement natural materials. The application of chemical synthesis or transformation was now providing industry, agriculture, medicine and other activities with new possibilities unthought of a few years ago.

Second, and perhaps the most spectacular line of advance was the application of atomic energy and the by-products of nuclear fission to domestic uses. Radioactive isotopes were already becoming an established branch of international trade, and British industry promised to become competitive in supplying the needs of other countries as well.

In discussing the prospects of automation, Sir Ivan described the third line of advance. This was the development of automatic machines and instruments which made it possible to hand over to a set of mechanical devices a great many of the tasks in factories and offices. With their tradition of craftsmanship and relatively small scale production, the British had never admired standardization for its own sake.

Other Factors

But apart from the vital need for holding our place in the world's markets, there were other factors which might drive us towards the adoption of automatic methods.

It had been the aim to condition TI to meet the impact of these scientific and technical changes. The first essential was the expansion of their research. Last year they had established additional laboratories at Hinxton Hall, Cambridge, under the direction of Dr. F. P. Bowden, F.R.S., where now the radioactive research group under Dr. A. Charlesby, D.Sc., Ph.D., formerly of Harwell, was equipped with an electron accelerator.

Writing about nuclear energy developments, Sir Ivan pointed out that although TI was not directly engaged in the design and production of atomically activated plants, it was playing its part in supplying essential components. They had always specialized in making tubes to withstand the ever higher temperatures and pressures, and the increasingly corrosive circumstances of modern manufacturing processes.

But preparation for the future had not diverted them from their immediate tasks. Although costs continued their upward spiral, trading profits after depreciation, at approximately £8,500,000, showed a vigorous recovery compared with two previous years when they fell to about £6,000,000. The improvement extended to all TI branches, and the aluminium division changed the substantial loss of the previous year to a profit. The two new tube plants at Desford and Wednesfield approached full-scale production.

Organo Tin Compounds

UNDER a recently concluded agreement, Albright & Wilson Ltd., of London, are to manufacture and market the range of organo tin compounds of the Metal & Thermit Corp. of America.

These organo tin compounds confer a heat stability on pvc which makes it possible to produce unplasticized compositions in the form of sheet and unmoulded sections, and their high chemical resistance makes them particularly suited for the manufacture of pipes and ducting. The compounds will be included in the Mellite range of stabilizers marketed by the organic chemicals division of Albright & Wilson Ltd.

Petro-Chem Iso-Flow Furnace

AT the beginning of this year Birwelco Ltd. of Aston, Birmingham, began the manufacture of the Petro-Chem Iso-Flow furnace under licence from Petro-Chem Development Co. Inc., of New York, and for the first time petroleum and chemical industries in Sterling areas were able to buy in £s a cylindrical type heater of proved performance. In a progress report the company says that the initial technical problems have been solved and an increasing number of units are now being supplied for oil refinery and chemical plant applications. The design of the furnace consists of a vertical cylindrical steel structure with an integral self-supporting stack, the inside of the cylindrical casing, lined with insulation and insulating refractory brick, forming the combustion chamber. A circle of vertical tubes adjacent to the cylindrical wall are equidistant from the flame burst of burners located in the floor of the furnace, and positive firing control is obtained through the use of multiple and directional burners. A central radiating cone at the upper end of the combustion chamber effects an even distribution of radiant heat and increases the velocity of flue gas with decreasing temperature at the upper section of the furnace. Uniform radiant heat transfer rates are obtained by subjecting the heating surface nearest the flame burst to a controlled amount of radiant heat while the upper sections of the heating surface are subjected to varying proportions of direct radiant and secondary radiant heat. All tubes are supported at the floor level as a column and guided at the top by removable segmental tube sheets eliminating horizontal tube stress which enables all parts of the furnace structure to expand vertically or circumferentially regardless of any temperature changes in the various sections.

Electrical Journal Red Book

The 65th edition of *The Electrical Journal Red Book* published by Benn Brothers, Bouverie House, 154 Fleet Street, London EC4, price 30s. (post free), has been completely revised. Among new features included this year are a rearrangement of area service centres to facilitate quicker reference, the addition of 70 new towns and districts in the Commonwealth and foreign sections, and an extension of the UK section of undertakings taking in the newly formed South of Scotland Electricity Board. A list of consumers' voltages is contained in the general index.

Dyeing Acrylic Fibres

Chemstrand Method Described to ACS

THE development of a synthetic wool fibre which is unique in that it can be easily coloured with standard dyes was described on 4 November at the south-eastern regional meeting of the American Chemical Society's local sections in the south.

Fibres of acrylic material have been found to resemble closely wool but normally they are very difficult to dye, explained Dr. Edgar D. Smith, of the Chemstrand Corporation, Decatur, Ala. In a paper presented before a symposium on products of textile research, he disclosed the chemical procedure which he said has made Chemstrand Corporation's recently-developed Acrilan fibre readily dyeable.

The difficult dyeing problem has been overcome by changing the chemical structure of the acrylic fibre molecule so that it will have sites which readily accept the dyes, according to Dr. Smith. Observing that it has been considered both necessary and desirable that the synthetic fibres be readily dyeable by conventional techniques, he continued:—

'To this end a considerable amount of research has been expended on finding the necessary techniques for incorporating dye-accepting molecules into Acrilan. Dyeability with the acid class of dyes normally used for wool dyeing was particularly sought to facilitate the dyeing of wool blends. The successful attainment of this goal has also made the dyeing of the 100 per cent fibre quite versatile since there are so many varied classes of acid dyes.

'Other dyeable ingredients have also been included in the composition with the result that this fibre accepts readily all the major classes of known dyes.'

Enough 'hitching posts' for the dye particles have been provided on the fibre molecules to make possible the attainment of heavy shades, Dr. Smith asserted. He added that the acid dyes produce much faster washable colours on the synthetic fibre than on wool because of the water-repellent nature of the synthetic.

The Ketjen Story

Development of Dutch Company

FIRST Dutchman to erect a plant for the manufacture of sulphuric acid from pyrites was Mr. Gerard Tieleman Ketjen, an Amsterdam trader in chemicals and paints who in 1835 started production of 60 Bé acid by the lead chamber process followed by concentration in a special unit. Later the more economic contact process was adopted and in 1940 the chamber process was abandoned altogether.

The company is now known as Koninklijke Zwavelfuurfabrieken v/h Ketjen NV, Amsterdam, and is a member of Nederlandsch Verkoopkantoor voor Chemische Producten NV.

However the economic uncertainties attaching to the manufacture of sulphuric acid alone soon became an incentive to consider the synthesis of such additional products as would permit utilization of company-produced sulphuric acid, SO_2 or SO_3 as a base material.

In the course of years, endeavours to widen the range of products led to the manufacture of ammonium sulphhate, iron and copper sulphate, Glauber's salt, sulphites and bisulphites and later soda-crystals and manganese sulphate.

In 1940, when the production of saccharin was initiated, Ketjen entered the field of organic chemistry. This led to the erection of further auxiliary units, some for the manufacture of the base materials for saccharin manufacture (potassium permanganate and chlorosulphonic acid) others for working up the by-products obtained into valuable end products. An example of the latter is the disinfectant Halamid (chloramine).

To-day Ketjen has two modern units for the manufacture of sulphuric acid from pyrites by the contact process, a third unit being designed for use of sulphur as base material.

Substantial additions have been made to Ketjen's manufacturing capacity since the end of the war. These additions were necessitated by fresh activities such as the manufacture of liquid sulphur dioxide, diphenylolpropane, dioctylphthalate, MS fluid cracking catalyst (Ketjencat) and MS fluid hydroforming catalyst, trade name Ketjenform (see THE CHEMICAL AGE, 1955, **73**, 842).

A threatened lack of space induced Ketjen last year to purchase a new factory site, adjoining the existing one.

The two catalyst plants, in particular, aroused a great deal of interest among oil people, due partly to the speed with which they were erected. For the construction of the cracking catalyst unit barely 13 months were needed, while the hydroforming catalyst unit took only some nine months to build.

The scientific staff of the departments concerned is also steadily expanding. As the works are easy of access (one approach being a busy fairway), Ketjen can make use of various transport facilities for the supply of raw materials and the despatch of end products. The firm has its own fleet of tankships, railway, tankcars and road tankers for the transport of sulphuric acid and other products.

Hungarian Scientists

THE seven Hungarian scientists who had been seeing British scientific establishments as guests of the Association of Scientific Workers concluded their 14-day tour with a Press conference at London's Waldorf Hotel on 9 November.

The party, which included two chemists and a biochemist, were agreed that British and Hungarian scientific research was progressing on almost parallel lines, and that Hungary had the same problem as this country in meeting demands for trained scientific staffs. In the past five years Hungary has trained over 4,000 scientists.

Professor Bruno F. Straub, a biochemist and a member of the Hungarian Academy of Sciences who studied two years at Cambridge from 1937 to the outbreak of war, said that Hungary was perhaps better informed than most countries in scientific trends as they had access to scientific journals from both East and West.

Although the itinery of the party was confined mainly to official establishments like the Imperial College, University College, the School of Mines, Birkbeck College and Battersea Polytechnic, four members, Professor Pal Gomori, Professor Karoly Polinszky, Professor of Inorganic Chemistry, and Dean of Industrial Chemistry, Veszprem, and physicists Dr. Peter Farago and Mr. Zalan Bodo visited ICI metals division and Albright & Wilson's phosphates factory in Birmingham.

BCIRA Annual Report

Record Income in Past Year

THE work of the British Cast Iron Research Association for the year 1954-55 is reviewed in its 34th annual report which has recently been published. In the previous report it was announced that DSIR had undertaken to maintain an annual block grant of £40,000 for five years, provided there was a minimum industrial contribution of £100,000. A supplementary grant up to £16,000 would also be made in return for further industrial contributions up to £20,000.

The industry, through the Joint Iron Council, has made these funds available, and as a result BCIRA's total income for the year reached the record figure of over £190,000, of which the amount received under conditional aid was £7,780. This latter source of income will be exhausted at the end of 1956.

A brief summary of the research work being undertaken by the association is contained in the report.

Work on the partitioning of nitrogen between metals such as aluminium and titanium etc., and iron, has been completed and the results have been published (**1**). A technique has been developed for the estimation of hydrogen in cast iron using vacuum heating (**2**). Much work on gases in cast iron has been summarized in a paper presented at the International Foundry Congress in London 1955 (**3**).

Field tests are still in progress on the application of cathodic protection to cast iron ship propellers. Many other corrosion problems have been dealt with throughout the year.

Routine chemical analysis has been studied in co-operation with other laboratories and several reports have been published. For example: the sampling of nodular cast iron for carbon determination (**4**) and for phosphorus determination (**5**) and a rapid method for the determination of magnesium in cast iron (**6**).

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(3) Morrogh, H., International Foundry Congress, London, 1955, paper 1137.
(4) Clarke, W. E., *BCIRA Journal*, 1954 (Oct.), **5**, 465.
(5) Clarke, W. E., *Ibid*, 1955 (June), **5**, 630.
(6) Green, H., *Ibid*, 1955 (Aug.), **6**, 20.

Tin in Building

THE use of tin-nickel alloy plating as a decorative finish for metals is recommended by the Tin Research Institute at the Building Exhibition at Olympia, London. This plating, says the Institute, is a brilliant and permanently durable electroplate, which can be applied to metal articles such as light fittings, switch plates, radiator grills, door furniture and bathroom accessories. It has a distinctive appearance, being warm and rose-tinted, in sharp contrast to the usual bluish tone of common plating. Tin-nickel alloy can be easily plated into deep recesses because of its exceptional 'throwing power.' It was invented at the Institute five years ago and has come successfully through trials of the most varied kinds.

IN THE EDITOR'S POST

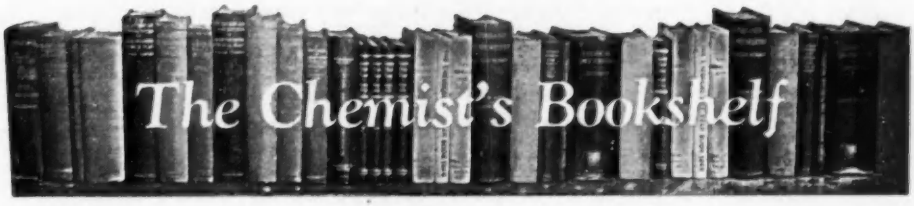
Chemical Research

SIR,—The report (THE CHEMICAL AGE, 1955, **73**, 885) of Mr. W. J. Worboys' speech at the annual general meeting of the ABCM, in particular the statement that 'there should be available in this country the means by which chemical manufacturers, irrespective of their size, can arrange for research to be done on specific problems,' requires some comment.

The expressed need is for adequate provision for privately sponsored research, and in this connection I would draw attention to existing sponsored research establishments such as the Fulmer Research Institute. Although Fulmer is primarily equipped for metallurgical research, it has on its staff a number of fully qualified physical chemists competent to undertake basic research connected with the chemical engineering industry. It is perhaps hardly necessary to point out that the aim of the sponsored research establishments is to serve industry; there is therefore little reason why present facilities should not be modified, developed or expanded to meet particular sponsors' requirements in any aspects of chemical engineering research.—Yours faithfully,

MORGAN H. DAVIES.
Development Officer,
Fulmer Research Institute,
Stoke Poges, Bucks.

(Editor's note: Similar facilities are available at the Sondes Place Research Institute, Dorking, Surrey.)



THE CHEMICAL KINETICS OF EXCITED STATES. By K. L. Laidler. Oxford University Press, London. 1955. Pp. 180. 30s.

This book presents a unified theoretical treatment of the chemical kinetics of reactions which involve electronically excited states. Such reactions fall into two main classes. Firstly, there are those reactions that are initiated by electromagnetic radiation or by high energy particles—photochemical and radiochemical reactions. Secondly, there are the so-called 'flame' reactions, which involve the emission of radiation.

Professor Laidler's approach has as its basis the theory of absolute reaction rates originated in 1935 by Eyring. A distinguished protagonist of the Eyring school, he is very well qualified for the task in hand, and he makes a success of it.

Of course, as the author admits, the validity of rate calculations for reactions involving excited states is questionable. Such calculations are based on the assumption that an equilibrium distribution prevails in the system during the reaction. This is very often far from true for reactions involving excited states, and a lot more work needs to be done on the statistical mechanics and chemical kinetics of such non-equilibrium systems. Meanwhile, Laidler assumes that the non-equilibrium introduces but small perturbation. If this is so his rate calculations are essentially valid.

Throughout, the treatment is lucid and frank, and, wherever possible, theory is compared with experimental data. Workers in the fields of photochemistry, radiation chemistry and kinetic flame spectroscopy will be grateful to Professor Laidler for presenting in a uniform, coherent and up-to-date way material common to all these fields.

The well-known high standard of production of the Oxford University Press is maintained in the present volume.—H. MACKLE.

FUEL, SOLID, LIQUID & GASEOUS. By J. S. S. Brame and J. G. King. 5th edition, rewritten by J. G. King. Edward Arnold (Publishers) Ltd., London. 1955. Pp. xii + 551. 50s.

Considerable progress has taken place in fuel technology since the fourth edition of this well-known book was published in 1935. Not only has fuel increased considerably in price but it is now obvious that the output of coal from mines in the United Kingdom will be limited and that supplies of coal suitable for coking and gas-making may be restricted. However, necessity is the mother of invention and never is this more true than in connection with fuel technology as may be seen from the outstanding developments in Germany during the inter-war years.

Research and development work is being actively pursued in a number of directions such as, for example, the gasification of weakly caking coals, the blending of coals for carbonization, the production of smokeless fuels and processes for the manufacture of town gas from heavy fuel oil. In recent years much attention has been paid to the improvement of domestic fuel using appliances and to methods of securing economy in the use of fuels generally. Revolutionary advances have been made in the techniques of oil refining and large refineries have been established in the United Kingdom. The greatly expanded use of middle-distillates with the increasing number of diesel engines, and the growing demand for kerosines suitable for gas turbines have altered the pattern of demand for liquid fuels. The wider use of heavy fuel oil is helping materially in the struggle to increase the available power for industry faster than the coal supplies alone will permit.

These changes are reflected in the subject matter of the book under review. While the general arrangement remains substantially the same, Dr. King has introduced much new material and the length of the book has

increased by 129 pages. The section on coal classification now includes the latest Seyler chart and also the Fuel Research and National Coal Board classification. The section on pulverized fuel has been brought up to date and information added on boiler availability and coal-fired gas turbines.

There is a new section on domestic heating and mention is made of both the heat pump and the fuel cell. The refining of petroleum, coal hydrogenation and the Fischer-Tropsch process are discussed and the uses of liquid fuels are also described.

Unfortunately there is a time-lag between the writing of a book and its appearance in print and this accounts for the fact that in a text book some aspects of a developing technology can never be quite up-to-date.

In the present book, although briefly mentioned, full details and diagrams of the newer processes for the gasification of heavy fuel oil have not been included. The Lurgi process for the gasification of coal in steam and oxygen under pressure is described but although newer systems using a fluidized fuel bed are mentioned, little information is given about the Winkler process.

A disappointing feature of the book is that it contains no detailed treatment of combustion calculations based on the use of the 'mol'. An error occurs on p. 476 where the temperature for the volatile matter test is given as 965°C. instead of 925°C.

This book will serve as an excellent introduction to the whole field of fuel technology not only for those who merely require a general survey but also for those who intend to specialize in the subject. It has a useful index and each chapter is well-provided with references. It will certainly be adopted as the standard text-book in many university and technical college courses.—B. LONG.

A COURSE IN MODERN TECHNIQUES OF ORGANIC CHEMISTRY. By R. P. Linstead, J. A. Elvidge & M. Whalley. Butterworths Scientific Publications, London; Academic Press Inc., New York. 1955. Pp. x + 190. 25s.

The striking progress of organic chemistry during the last two or three decades has been largely dependent on the use of a number of powerful new techniques for separation and quantitative analysis. Chromatography and absorption spectrometry are typical examples. These new developments have raised an educational problem by creating a gap between the training of the average undergraduate and the requirements of the research worker. A new course designed to bridge this gap was introduced at the Imperial College of Science and Technology in 1951, and this volume is the outcome of experience gained there.

The book is divided into three sections. The first is concerned with methods of separation and purification, and opens with four chapters on the various types of chromatography. Countercurrent distribution, ionophoresis, fractional distillation and vacuum sublimation are among the other topics dealt with, and the final purification of solids and liquids for analysis is discussed.

The second section describes applications of special reaction techniques, including catalytic hydrogenation, ozonolysis, preparative electrolysis and vacuum-line technique, as well as examples of vapour-phase catalysed reactions, of reactions in liquid ammonia and of the use of lithium aluminium hydride.

The third section gives experiments to illustrate certain quantitative methods including potentiometric titration, polarographic analysis, colorimetric analysis and absorption spectrometry in the visible and ultra-violet regions. The determination of active hydrogen and of molecular weights is also discussed, but microanalytical procedures and infra-red spectrometry are omitted for the excellent reason that these operations are usually carried out by specially trained technical staff. The semimicro determination of carbon and hydrogen and the micro-Kjeldahl method for nitrogen have however been included for their education value.

The book provides a well balanced course whose snags have been ironed out by experience, and it will undoubedly be very useful to teachers who are designing similar courses. The value of the book as an undergraduate text is limited to some extent by a slight lack of flexibility; the detailed 'recipe' descriptions of one or two examples of each technique may make the student less sensitive to the more general aspects of his laboratory work and may cause confusion if slightly modified apparatus is provided. Research workers will find that the book not only contains many useful key references, but also provides a wealth of incidental information which makes browsing through its pages a profitable pleasure.—P. SCHWARZ.

HOME

The Fertiliser Society.

At the general meeting of The Fertiliser Society at Burlington House, Piccadilly, London W1, on 1 December, Dr. D. Williams, M.Sc., will present a paper entitled 'Product Control in Fertiliser Manufacture'.

Plastics Exhibition & Convention

The fourth British Plastics Exhibition & Convention will be held in the Grand Hall, Olympia, London, from 10 to 20 July 1957. The convention, which will be international in character, will run concurrently. The exhibition which, in previous years, has shown only the materials, plant and products of the UK and the British Commonwealth, will be extended to include exhibits from foreign countries.

Research on Hydro-Oxygen Cells

The Minister of Fuel and Power, Mr. Geoffrey Lloyd, made a statement in the House of Commons on 14 November on the progress in research on the production of electric power from hydrogen-oxygen cells. Mr. Lloyd, who was replying to Mr. J. R. H. Hutchison, said that since 1951 the Government had contributed about £9,000 for this purpose. The Bacon Fuel Cell had already reached an encouraging stage of technical development and the possibility of its commercial development was now being investigated.

Exemptions From KID

The Treasury have made an order under section 10 (5) of the Finance Act, 1926, exempting the following articles from Key Industry Duty, for the period beginning 21 November, 1955, and ending 18 February, 1956: synthetic organic chemicals, analytical reagents, other fine chemicals and chemicals manufactured by fermentation processes, the following: 4-Aminosalicylic acid, Deserpidine (a methyl ester), Methyl α-phenyl-2-piperidylacetate hydrochloride (a methyl ester), Phenoxymethylpenicillin, R. Potassium carbonate, and Rescinnamine (a methyl ester). This order is the Safeguarding of Industries (Exemption) (No. 8) Order, 1955, and is published as Statutory Instruments, 1955, No. 1711. Copies of the order may be obtained (price 2d net, by post 3½d) from HM Stationery Office.

Petroleum Research Laboratory

British Petroleum Chemicals Ltd. have had plans approved for the erection of a research laboratory and extensions to the works in Bo'ness Road, Grangemouth, Stirling, at a total cost of £76,000.

New Switch House

Forth Chemicals Ltd., Grangemouth, Stirling, will shortly construct a new switch house at an expenditure of £44,000.

Dangerous Goods & Explosives

The 15th list of Amendments to Appendix A of the 1951 Report of the Departmental Committee on the Carriage of Dangerous Goods & Explosives in Ships may now be obtained from HMSO, price 6d.

Correction

As the result of a printer's error in THE CHEMICAL AGE, 1955, **73**, 1071, the price of the September *Bulletin of the British Whiting Research Laboratories* to non-members was given as 1s. This should read 5s.

Gas Research Laboratories

Three new laboratories for fundamental research into problems connected with the production and purification of gas were opened by Sir Robert Robinson, president of the British Association and a member of the Gas Council Research Committee, at the Gas Council's research station at Fulham on 18 November.

Synthetic Rubber for UK

Four major tyre companies, Dunlop, Goodyear, Firestone, and Michelin are subscribing to a new undertaking, The International Synthetic Rubber Co. Ltd., with the object of producing general purpose synthetic rubbers in the UK. The company will have a nominal capital of £100 in £1 shares, but it is proposed, subject to CIC consent, that the capital to be raised should be £7,000,000, with provision to raise a further £2,000,000 if necessary. The four sponsoring companies have already agreed to subscribe capital and other tyre manufacturing companies are being invited to participate. The initial production of the company is expected to be in the region of 50,000 tons of general purpose synthetic rubber a year, and should commence in 1958.

• OVERSEAS •

Sulphuric Acid Plant

The Albatros Super Phosphate Factories of Utrecht, Holland, have announced that they are to start work immediately on building a new sulphuric acid plant.

US Carbon Black

Daily average shipments of furnace black in the US during September increased by eight per cent over August, reports the Bureau of Mines. Contact black shipments increased by two per cent. By the end of the month total stocks had declined 5,000,000 lb.

Agreement Modified

It is believed that the trade agreement between France and Chile is to be modified to include an additional sale to France of 120,000 tons of Chilean nitrate and 9,000 tons of copper.

Kanigen Chemical Process

The Kanigen chemical process for nickel plating which was developed in the US is to be introduced into Australia by A. E. Goodwin Ltd., of Sydney. The process deposits a hard, uniform nickel-phosphorous coating on iron, copper on aluminium, and operates through a chemical bath without the use of electricity.

Israeli Phosphate

New equipment which recently arrived at the phosphate mines near the Dead Sea, Israel, will gradually make possible a yield of 10,000 tons a month, says the Israeli Ministry of Development. The present output a month is between 2,000 and 2,500 tons. During the first seven months of this year phosphate exports amounted to 2,825 tons, valued at $120,000, as compared with 7,000 tons last year.

Dow Expansion Plan

Dow Chemical Co. of Canada have released details of the second major expansion programme at its Sarnia, Ontario, plant. The company is to spend $10,000,000. Of this, $3,000,000 will be spent on an additional ethylene plant; $1,000,000 on a plant to produce pentachlorophenol and $1,000,000 to increase prochlorine and caustic soda production facilities. Other projects include the enlargement of the glycol plant, and a new service water pumping capacity.

Aden Refinery Record

BP's Aden refinery, commissioned in July 1954, had processed 5,000,000 tons of crude oil by the end of October last. The throughput for October was a record for any one month—432,000 tons.

Swedish Sulphate Mill

Fiskeby Fabriks AB, large kraft and wrapping-paper manufacturers, are to build another sulphate mill near Skärblacka, Ostergötland. To be completed in three years at a cost of £4,140,000, the plant will have an annual capacity of 60,000 tons. Fiskeby Fabriks AB are members of the Swedish Co-operative Union.

New Canadian Distillation Plant

A new atmospheric distillation plant went into operation earlier this month at the Port Credit refinery of Regent Refining (Canada) —formerly Trinidad Leaseholds (Canada)— as part of the company's $8,000,000 expansion programme. The plant, which cost more than $1,000,000, has an electronic control system and will handle 20,000 barrels daily.

Furnace to Raise Carbide Output

Australian carbide production will be stepped up 50 per cent following the installation of a new furnace at the Australian Carbide Co.'s works at Electrona, Tasmania. The company's present output is 10,000 tons a year. The company's Hobart representative said that the larger output would still fall short of Australia's total demand for 18,000 tons a year. Australia imports carbide from South Africa and Sweden.

NZ Government Withdraws From BP

The Hon. J. T. Watts, the New Zealand Minister of Finance, announced on 15 November that his Government would sell its shareholding in The BP Co. of New Zealand. The NZ Government holds £NZ1,275,000 shares (51 per cent as against 49 per cent held by BP). The decision followed BP's need to raise additional capital for a development programme which, said the minister, would have meant increased investment by the Crown. When the Government's shareholding was offered for sale, BP agreed to purchase it.

· PERSONAL ·

MR. KENNETH GEORGE PLATT, A.C.A., has been appointed chief accountant of British Oxygen Co. Ltd. in succession to MR. ALEXANDER DUNCAN SMART, C.A., who has been appointed secretary of the company. Mr. Platt has been with the company for two years and Mr. Smart, who joined the company in 1939, has been chief accountant since 1951.

MR. P. W. CLEPHAN, general manager of the St. Helens Cable & Rubber Co. Ltd., of Slough, Bucks, was recently appointed a director.

Sunvic Controls Ltd. announce they have appointed MR. O. L. WELBORN general representative for the South-west area, and MR. W. J. DONNELLY technical representative in the Midlands area for their scientific and industrial division. Both appointments start from 1 December.

DR. G. L. J. BAILEY, B.Sc., Ph.D., A.R.C.S., D.I.C., has been appointed superintendent of the platinum metals research laboratory in the development & research department of The Mond Nickel Co. Ltd. at Acton, London, in succession to DR. E. C. RHODES, B.Sc., Ph.D. The appointment becomes effective on 1 February, 1956. Dr. Bailey studied at Imperial College, London University, where he obtained a B.Sc. degree in 1937 and his Ph.D. in 1939. Later in 1939 he joined the staff of the Admiralty at West Drayton, Middlesex, and in 1945 joined the British Non-Ferrous Metals Research Association, where he is now deputy research manager. Dr. Bailey is a Fellow of the Institute of Physics and a Fellow of the Institution of Metallurgists. He is a member of the Institute of Metals, the Institute of Metal Finishing and other societies, and is the author of several scientific papers. Another appointment is that of MR. E. J. BRADBURY, B.Sc., M.Eng., to be assistant superintendent of the development & research department laboratory of The Mond Nickel Co. in Birmingham. An associate member of the Institution of Mechanical Engineers and an Associate of the Institution of Metallurgists, Mr. Bradbury is also a member of the Institute of Metals and the Iron & Steel Institute.

Sharples Centrifuges Ltd., of Tower House, Woodchester, Stroud, Glos, announce the appointment of MR. M. E. O'KEEFFE TROWBRIDGE, B.Sc., A.C.G.I., A.M.I.Chem.E. as a director of the company. Mr. Trowbridge, who graduated in chemical engineering at London University, has had extensive experience in the chemical and chemical engineering industry in Europe and the US. He joined Sharples in 1953 and has been responsible for the company's technical, technical sales and project engineering activities. He will continue to have overall responsibility for these functions.

MR. ALAN THOMAS, A.C.I.S., has been appointed secretary and accountant of British Oxygen Chemicals Ltd., a subsidiary company of the British Oxygen Co. Ltd. The formation of the new company, announced last month, is part of the parent company's expansion programme. The registered offices are at Bridgewater House, Cleveland Row, London W1, and there are plants for the manufacture of melamine and polyvinyl acetate at Chester-le-Street, County Durham, where Mr. Thomas has his office.

MR. H. A. A. WHILE, manager of the United Steel Co. Ltd.'s London offices, has been appointed a director of the Workington Iron & Steel Co. Ltd.

MR. SYDNEY RUSSELL COCKETT, M.Sc. Tech., F.R.I.C., A.M.C.T., of Lightcliffe, Halifax, has been elected a Fellow of the Textile Institute. An applications chemist with Sandoz Products Ltd., of Bradford, Mr. Cockett studied at Manchester College of Technology where he secured his M.Sc. (Tech). degree in 1941. Previously he pursued part-time studies at Salford Royal Technical College. During the war Mr. Cockett was scientific officer at the Wool Industries Research Association. After some years with

BDA Ltd. he joined Sandoz Products Ltd. in 1952. Mr. Cockett is a joint holder of a British patent relating to dyeing, and is the co-author of several books on the basic chemistry of textile preparation and colouring which are now being prepared.

The President of the Board of Trade has appointed MR. C. H. G. MILLIS, D.S.O., O.B.E., M.C., to be a part-time member of the National Research Development Corporation His appointment is for three years. Mr. Millis, a partner in Baring Bros. & Co. Ltd., was vice-chairman of the BBC from 1937 to 1946. The Corporation was set up in June, 1949, under the Development of Inventions Act, 1948, for the purpose of developing and exploiting inventions resulting from publicly financed research, and other inventions which appear to be worthwhile but which are not otherwise being brought into use.

Election of three Fellows has been announced by the council of the Society of Dyers and Colourists. They are: MR. R. S. LEDGER, of English Sewing Cotton, who has been engaged in development work in the introduction of new dyes and techniques; MR. E. I. NOBLE, who before going to Australia, where he started his own business and became president of the Society of Dyers and Colourists of Australia, was representative of the Sandon Company in the West Riding of Yorkshire; and MR. W. TAUSSIG, of the Clayton Aniline Company, who has published a number of papers and taken out several patents.

MR. G. T. BRITTON, deputy divisional labour manager for Imperial Chemical Industries Ltd., Billingham-on-Tees, has been appointed deputy commercial manager and takes up his new duties early next year. He succeeds DR. G. A. W. PIKE, Ph.D., B.Sc., A.R.C.S., D.I.C., who has been appointed staff manager of Metals Division. Mr. Britton started his career at Billingham-on-Tees in 1927 as plant manager for the nitrates section. He became deputy labour manager in April 1953. Dr. Pike went to Billingham in 1939 as a chemist in the research department. He took up his present position in November 1954.

DR. LAUCHLIN M. CURRIE has been appointed a vice-president of Union Carbide Nuclear Co. He was formerly vice-president of National Carbon Co., another division of Union Carbide. Dr. Currie joined Union Carbide as a research chemist for National Carbon Co. at Cleveland, Ohio, in 1925. Subsequently he was given administrative positions in both research and production with National Carbon and Bakelite Co. In 1945, he was appointed vice-president in charge of research of the National Carbon Co.

DR. ALEX G. OBLAD, manager of research and development of the Houdry Process Corporation, Marcus Hook, Pa., US., has been elected chairman of the American Chemical Society's Division of Petroleum Chemistry for 1955-56. He succeeds DR. EVERETT C. HUGHES, chief of the chemical and physical research division of the Standard Oil Company of Ohio, Cleveland. DR. SHERMAN S. SHAFFER, staff associate in the refining, technical and research divisions of the Humble Oil and Refining Company, Baytown, Tex., was named chairman-elect, and MR. WHEELER G. LOVELL, director of automotive products developing in the Ethyl Corporation, Detroit, was re-elected secretary-treasurer.

Obituary

The firm and its Torquay branch were represented at the funeral service at Holne Parish Church, near Newton Abbot, on Tuesday 15 November, of MR. ALBERT EDWARD GARRETT, aged 85, of The Nook, Holne, who for 44 years was analyst and scientific adviser to the Jaeger Co. Ltd.

MR. HARRY LIMNELL LYON, chairman of John Harker and a director of Yorkshire Tar Distillers, died on 19 November at Hillam Hall, Monk Fryston, West Riding, aged 76.

Russians Visit Britain

A party of five Russian scientists arrived in London last week for a fortnight's visit to Britain. The purpose of the visit, which is being made at the invitation of the Royal Society, is to meet British scientists working in similar fields of research. An organic chemist, Academician A. N. Nesmeyanov, president of the USSR Academy of Sciences, is leading the team, which consists of a physical chemist, a plant physiologist, a mathematician and a hydraulics engineer. Visits to Oxford, Cambridge, Edinburgh and various centres in London have been arranged.

Publications & Announcements

TWO brochures on polytetrafluoroethylene (ptfe) have recently been published, one by Dunlop Rubber Co. Ltd., Cambridge Street, Manchester 1, and the other by Crane Packing Ltd., of Slough. The ability of ptfe to withstand attack is particularly valuable in the chemical industry and in chemical processes generally says the Dunlop brochure. The baking industry also uses ptfe for covering dough sheeting rollers, where its non-stick properties prevent dough build-up and reduce the frequency of stoppages for cleaning. Crane Packing manufacture ptfe in the form of rods, tubes, rounds, discs, flat sheets, cylinders, tape, cord and loose strandings. Some illustrations are reproduced showing a range of CF2 components, as Crane Packing call their product. Both brochures refer to the use of ptfe dispersion coatings which are obtained by applying to an article a dispersion of ptfe, resin in water.

* * *

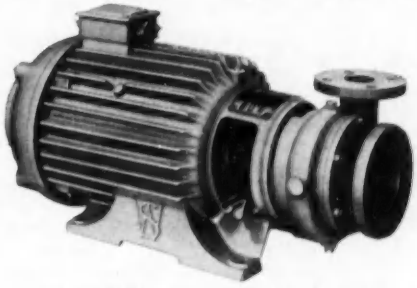
SOME new entries in the catalogue of British Drug Houses, Poole, Dorset, have been announced for October. The sodium salt of *o*-hydroxy diphenyl has appeared in the BDH catalogue for many years, but for the first time the free phenol is now available as a pale pink powder, mp. 56-8°C. Both this material and its sodium salt are claimed to have good bacteriological and fungicidal activity combined with low toxicity towards animals and humans. Stable complexes with a variety of aromatic hydrocarbons are formed by 2:4:7 trinitrofluorenone. The complexes are said to be readily prepared and generally melt sharply without decomposition. The hydrocarbon portion of the complex can be recovered by passing it over activated alumina. This substance is now supplied as a pale yellow crystalline powder mp. 175-6°C.

* * *

SOME applications of Kez-Strip, a multi-purpose brush strip made by Kleen-e-ze Brush Co. Ltd., Hanham, Bristol, are shown in a leaflet published by the company. A narrow metal band is filled with fibre or bristle or nylon or a combination of materials. The strip so formed can be of any shape or size. Suitable applications suggested include the cleaning of equipment used in baking, meat packing and processing, fruit and vegetable dehydration and canning, flour milling, dairies and creameries, and confectionery. A Kez-Strip metal backed conveyor belt brush is claimed to have shown less than five per cent wear after 10,000 brushing miles.

* * *

LATEST addition in the range of pumps manufactured by Worthington-Simpson, Ltd., of Newark, Notts, is a range of centrifugal chemical pumps having resistance to many acids, alkalis and slurries. The superiority of these pumps, claim the makers, can best be gauged by the fact that they can handle sulphuric acid with a high degree of resistance, i.e., a corrosion loss of up to 0.005 inches per year when made in Worthite—one of the two materials of construction. The pumps, available in three different forms, are Type DFC of monobloc construction which are combined as one unit with totally enclosed, fan-cooled motors up to 1 BHP in 3-phase type, 1½ BHP in single phase, and 2 BHP in DC wound for standard voltage ranges. Type



The DMC type monobloc pump

DMC, also of monobloc construction, is also combined as one unit with totally enclosed, fan cooled 3-phase motors up to 17½ BHP with windings impregnated with acid-resisting varnish. Stock motors are wound for 220/380, 400/440, 346/380 and 500/550 volts, but other voltages can be supplied. Of this type, single-phase capacitor motors up to 6 BHP in standard ranges between 220/550 volts are also available. The rotors are of the squirrel-cage type and virtually indestructible. Worthite, alternated with stainless steel in construction of the pumps, is a corrosion-resisting alloy steel which is

greatly superior to the standard austenitic steel, particularly in pumping sulphuric acid. Containing more than 50 per cent of the alloying elements, the carbon content is kept below .07 per cent to reduce to a minimum the tendency towards inter-granular attack or inter-crystallizing corrosion.

* * *

SOME of the work being done at the atomic energy centre at Oak Ridge, Tennessee, is described in a new 44 page booklet 'The Atom in Our Hands,' which has just been published by Union Carbide and Carbon Corporation. Included in the booklet is a description of the unique process used to separate billions of uranium atoms to isolate the rare type of uranium 235 needed for atomic energy operations. The booklet also tells how radioisotopes are produced. The reader is given a glimpse of atoms at work in medicine, industry and agriculture. There are also photographs of several atomic reactors, including the swimming pool reactor built by Union Carbide for the 'Atoms for Peace' Conference held in Geneva, Switzerland, in August. Copies of the booklet may be obtained by writing to Union Carbide & Carbon Corporation, Room 308, 30 East 42nd Street, New York 17, NY.

* * *

A NEW 36-page booklet on the Columbia activated carbon system of solvent recovery has been issued by Carbide & Carbon Chemicals Co., a division of Union Carbide & Carbon Corp. It contains technical data on activated carbon and describes the efficiency and economy of recovering solvent vapours in a variety of industries. Complete recovery plants with capacities from 50 gallons of solvent a day to over 100,000 gallons a day which are designed and supplied for specific conditions and requirements are described, and a chapter outlines where the system can be used. Copies of the booklet (Form 4410D) are available from Carbide & Carbon Chemicals Company, 30 East 42nd Street, New York 17, New York.

* * *

SCIENTIFIC instruments manufactured by C. F. Casella & Co. Ltd. of Regent House, Fitzroy Square, London W1, are listed in a new catalogue, No. 808, 'Thermometers, Hydrometers and Scientific Instruments.' The catalogue has been written in such a way as to give more than a mere list of products: technical information is given to help in both the choice and usuage of thermometers and instruments. Each section commences with introductory pages on the problems applicable to that section. The publication includes thermometers which have not appeared in the firm's range since the last catalogue of these lines was published about 15 years ago.

* * *

A NEW miniature squirrel cage motor is now being produced by Jones & Stevens Ltd., instrument makers and engineers, of Long Lane, Littlemore, Oxford. This tiny fractional horsepower AC motor has a nominal driving speed of 2,700 rpm and is rated at approximately 1/70th HP. Measuring 2 in. by 3 in. with a ¼ in. long shaft, the complete motor weighs 8 oz. It is precision built with a ground shaft mounted in sintered bearings and requires no maintenance. The manufacturers state that delivery of these motors is approximately three weeks from date of order and large or small quantities can be supplied.

Laboratory Fire

Damage estimated at hundreds of pounds was caused by a fire which followed an explosion early on 8 November in one of eight laboratories of Distillers Co. (Biochemicals) Ltd., Commercial Road, Bromborough. Four fire engines from Port Sunlight and Birkenhead had the fire under control within 20 minutes of the alarm being given. It was the first fire of any size since the company took over the premises eight years ago. A spokesman of the company said it would be some time before the laboratory would be in use again.

University Research Grants

Among grants recently acknowledged by the University of Leeds was a donation of $6,000 from the Dow Chemical Co., of Michigan, to further research in para-magnetic resonance, and £900 from the Wool Textile Research Council for research in colour chemistry and dyeing. The Wool Textile Research Council also gave £9,967 to the department of textile industries—£6,627 of the grant to be used in research under the direction of Professor J. B. Speakman, D.Sc., F.T.I.; and £3,340 for research purposes directed by Professor A. H. Nissan, Ph.D., D.Sc., A.M.I.Mech.E., F.Inst.P.

British Chemical Prices

(These prices are checked with the manufacturers, but it must be pointed out that in many cases there are variations according to quantity, quality, place of delivery, etc.)

LONDON.—The market has not shown any definite trend during the past week and prices continue firm and unchanged. Home trade buying has remained on a good scale with contract deliveries well up to schedule. A good inquiry for shipments has been reported despite keen competition from the Continent. The coal tar products are in steady demand and the immediate output of most items is already covered. Prices in this section are unchanged at recent levels.

MANCHESTER.—Steady to firm price conditions have been reported this week in pretty well all sections of the Manchester market for heavy chemical products. Most of the leading industrial outlets in Lancashire and the West Riding of Yorkshire are taking steady deliveries against contracts and a fair amount of new business is coming through. For the most part the demand seems to be keeping pace with available supplies. Apart from one or two lines business in fertilizers is described as moderate, but in the market for the by-products a steady outlet continues to be found for most of the light and heavy materials.

General Chemicals

Acetic Acid.—Per ton : 80% technical, 10 tons, £83 ; 80% pure, 10 tons, £89 ; commercial glacial, 10 tons, £91 ; delivered buyers' premises in returnable barrels (technical acid barrels free) ; in glass carboys, £7 ; demijohns, £11 extra.

Acetic Anhydride.—Ton lots d/d, £123 per ton.

Alum.—Ground, about £25 per ton, f.o.r. MANCHESTER : Ground, £25.

Aluminium Sulphate.—Ex works, £14 15s. per ton d/d. MANCHESTER : £14 10s. to £17 15s.

Ammonia, Anhydrous.—1s. 9d. to 2s. 3d. per lb.

Ammonium Bicarbonate.—2-cwt. non-returnable drums, 1-cwt. non-returnable kegs ; 1-ton lots, £50 5s. per ton.

Ammonium Chloride.—Per ton lot, in non-returnable packaging, £27 17s. 6d.

Ammonium Nitrate.—D/d, £31 per ton (in 4-ton lots).

Ammonium Persulphate. — MANCHESTER : £6 2s. 6d. per cwt., in 1-cwt. lots. delivered. £112 10s. 0d. per ton, in minimum 1-ton lots, delivered.

Ammonium Phosphate.—Mono- and di-, ton lots, d/d, £97 and £94 10s. per ton.

Antimony Sulphide.—Crimson, 4s. 4d. to 4s. 9½d. ; golden, 2s. 7½d. to 4s. 0½d. ; all per lb., delivered UK in minimum 1-ton lots.

Arsenic.—Per ton, £45 to £50 ex store.

Barium Carbonate.—Precip., d/d : 4-ton lots, £41 per ton ; 2-ton lots, £41 10s. per ton, bag packing.

Barium Chloride.—£42 15s. per ton in 2-ton lots.

Barium Sulphate (Dry Blanc Fixe).—Precip., 4-ton lots, £42 10s. per ton d/d ; 2-ton lots, £43 per ton d/d.

Bleaching Powder.—£28 12s. 6d. per ton in returnable casks, carriage paid station, in 4-ton lots.

Borax.—Per ton for ton lots, in hessian sacks, carriage paid : Technical, anhydrous, £61 10s. ; granular, £41 ; crystal, £43 10s. ; powder, £44 10s. ; extra fine powder, £45 10s. ; BP, granular, £50 ; crystal, £52 10s. ; powder, £53 10s. ; extra fine powder, £54 10s.

Boric Acid.—Per ton for ton lots, in hessian sacks, carriage paid : Technical, granular, £70 ; crystal, £78 ; powder, £75 10s. ; extra fine powder, £77 10s. ; BP granular, £83 ; crystal, £90 ; powder, £87 10s. ; extra fine powder, £89 10s.

Calcium Chloride.—Per ton lots, in non-returnable packaging : solid, £15 ; flake, £16.

Chlorine, Liquid.—£37 10s. per ton, in returnable 16-17-cwt. drums, delivered address in 3-drum lots.

Chromic Acid.—2s. 0⅛d. per lb., less 2½%, d/d UK, in 1-ton lots.

Chromium Sulphate, Basic.—Crystals, 7⅛d. per lb. delivered (£73 10s. per ton).

Citric Acid.—1-cwt. lots, £10 5s. cwt.

Cobalt Oxide.—Black, delivered, bulk quantities, 13s. 2d. per lb.

Copper Carbonate.—3s. per lb.

Copper Sulphate.—£114 15s. per ton f.o.b., less 2% in 2-cwt. bags.

Cream of Tartar.—100%, per cwt., about £11 12s.

Formaldehyde.—£37 5s. per ton in casks, d/d.

Formic Acid.—85%, £86 10s. in 4-ton lots, carriage paid.

Glycerine.—Chemically pure, double distilled 1.260 S.G., £13 3s. 6d. to £13 14s. 6d. per cwt. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

Hydrochloric Acid.—Spot, about 12s. per carboy d/d, according to purity, strength and locality.

Hydrofluoric Acid.—59/60%, about 1s. 3d. to 1s. 6d. per lb.

Hydrogen Peroxide.—27.5% wt., £128 10s. per ton. 35% wt., £158 per ton d/d. Carboys extra and returnable.

Iodine.—Resublimed B.P., 17s. 7d. per lb., in 28-lb. lots.

Iodoform.—£1 6s. 7d. per lb., in 28-lb. lots.

Lactic Acid.—Pale tech., 44 per cent by weight, 14d. per lb. ; dark tech., 44 per cent by weight, 8½d. per lb., ex-works ; chemical quality, 44 per cent by weight, 12½d. per lb., ex-works ; 1-ton lots, usual container terms.

Lead Acetate.—White : About £143 10s. per ton.

Lead Nitrate.—About £129 10s. 1-ton lots.

Lead, Red.—Basis prices per ton. Genuine dry red, £135 10s. ; orange lead, £147 10s. Ground in oil : red, £153 ; orange, £165. £165

Lead, White.—Basis prices : Dry English in 5-cwt. casks, £141 10s. per ton. Ground in oil : English, 1-cwt. lots, 178s. per cwt.

Lime Acetate.—Brown, ton lots, d/d, £40 per ton ; grey, 80-82%, ton lots, d/d, £45 per ton.

Litharge.—£137 10s. per ton, in 5-ton lots.

Magnesite.—Calcined, in bags, ex-works, about £21 per ton.

Magnesium Carbonate.—Light, commercial, d/d, 2-ton lots, £84 10s. per ton, under 2 tons, £92 per ton.

Magnesium Chloride.—Solid (ex-wharf), £16 per ton.

Magnesium Oxide.—Light, commercial, d/d, under 1-ton lots, £245 per ton.

Magnesium Sulphate.—Crystals, £16 per ton.

Mercuric Chloride.—Technical Powder, £1 5s. per lb., in 5-cwt. lots ; smaller quantities dearer.

Mercury Sulphide, Red.—£1 9s. 3d. per lb., for 5-cwt. lots.

Nickel Sulphate.—D/d, buyers UK £170 per ton. Nominal.

Nitric Acid.—80° Tw., £35 per ton.

Oxalic Acid.—Home manufacture, minimum 4-ton lots, in 5-cwt. casks, about £130 per ton, carriage paid.

Phosphoric Acid.—Technical (S.G. 1.700) ton lots, carriage paid, £92 per ton ; B.P. (S.G. 1.750), ton lots, carriage paid, 1s. 3½d. per lb.

Potash, Caustic.—Solid, £93 10s. per ton for 1-ton lots ; Liquid, £36 5s.

Potassium Carbonate. — Calcined, 96/98%, about £74 10s. per ton for 1-ton lots, ex-store.

Potassium Chloride.—Industrial, 96%, 1-ton lots, about £24 per ton.

Potassium Dichromate.—Crystals and granular, 1s. 1d. per lb., in 5-cwt. to 1-ton lots, d/d UK.

Potassium Iodide.—B.P., 14s. 1d. per lb. in 28-lb. lots ; 13s. 7d. in cwt. lots.

Potassium Nitrate.—In 4-ton lots, in non-returnable packaging, paid address, £63 10s. per ton.

Potassium Permanganate.—BP, 1-cwt. lots, 1s. 9d. per lb. ; 3-cwt. lots, 1s. 8½d. per lb. ; 5-cwt. lots, 1s. 8d. per lb. ; 1-ton lots, 1s. 7¾d. per lb. ; 5-ton lots, 1s. 7¼d. per lb. ; Tech., 5-cwt. packed in 1-cwt. drums, £8 14s. 6d. per cwt. ; packed in 1 drum, £8 9s. 6d. per cwt.

Salammoniac.—Per ton lot, in non-returnable packaging, £45 10s.

Salicylic Acid. — MANCHESTER : Technical 2s. 7½d. per lb. d/d.

Soda Ash.—58% ex-depot or d/d, London station, about £15 5s. 6d. per ton, 1-ton lots.

Soda, Caustic.—Solid 76/77%; spot, £30 to £32 per ton d/d (4 ton lots).

Sodium Acetate.—Commercial crystals, £91 per ton d/d.

Sodium Bicarbonate.—Per ton lot, in non-returnable packaging, £15 10s.

Sodium Bisulphite. — Powder, 60/62%, £42 15s. d/d in 2-ton lots for home trade.

Sodium Carbonate Monohydrate.—Per ton lot, in non-returnable packaging, paid address, £59 5s.

Sodium Chlorate.—About £80 per ton in 1-cwt. drums, carriage paid station, in 4-ton lots.

Sodium Cyanide.—96/98%, £113 5s. per ton lot in 1-cwt. drums.

Sodium Dichromate.—Crystals, cake and powder, 10¾d. per lb. Net d/d UK, anhydrous, 1s. 0½d. per lb. Net del. d/d UK, 5-cwt. to 1-ton lots.

Sodium Fluoride.—Delivered, 1-ton lots and over, £4 15s. per cwt.; 1-cwt. lots, £5 5s. per cwt.

Sodium Hyposulphite.—Pea crystals £35 15s. a ton; commercial, 1-ton lots, £32 10s. per ton, carriage paid.

Sodium Iodide.—BP, 17s. 1d. per lb. in 28-lb. lots.

Sodium Metaphosphate (Calgon).—Flaked, loose in metal drums, £133 per ton.

Sodium Metasilicate.—£25 per ton, d/d UK in ton lots, loaned bags.

Sodium Nitrate.—Chilean refined granulated over 98% 6-ton lots, d/d station, £28 10s.

Sodium Nitrite.—£32 per ton (4-ton lots).

Sodium Percarbonate.—12½% available oxygen, £8 6s. 9d. per cwt. in 1-cwt. kegs.

Sodium Phosphate.—Per ton d/d for ton lots: Di-sodium, crystalline, £38 10s., anhydrous, £84; tri-sodium, crystalline, £39 10s., anhydrous, £82.

Sodium Silicate.—75-84° Tw. Lancashire and Cheshire, 4-ton lots, d/d station in loaned drums, £10 15s. per ton; Dorset, Somerset and Devon, £3 17s. 6d. per ton extra; Scotland and S. Wales, £3 per ton extra. Elsewhere in England, excluding Cornwall, and Wales, £1 12s. 6d. per ton extra.

Sodium Sulphate (Glauber's Salt).—About £9 5s. per ton d/d.

Sodium Sulphate (Salt Cake).—Unground. £6 per ton d/d station in bulk. MANCHESTER: £6 10s. per ton d/d station.

Sodium Sulphide.—Solid, 60/62%, spot, £33 2s. 6d. per ton, d/d, in drums in 1-ton lots; broken, £34 2s. 6d. per ton, d/d, in drums in 1-ton lots.

Sodium Sulphite.—Anhydrous, £66 5s. per ton; commercial, £25 5s. to £27 per ton d/d station in bags.

Sulphur.—Per ton for 4 tons or more, ground, £20 to £22, according to fineness.

Sulphuric Acid.—Net, naked at works, 168° Tw. according to quality, per ton, £10 7s. 6d. to £12; 140° Tw., arsenic free, per ton, £8 12s. 6d.; 140° Tw., arsenious, per ton, £8 4s. 6d.

Tartaric Acid.—Per cwt.: 10 cwt. or more £13 15s.

Titanium Oxide.—Standard grade comm., with rutile structure, £162 per ton; standard grade comm., £142 per ton.

Zinc Oxide.—Maximum price per ton for 2-ton lots, d/d, white seal, £107; green seal, £105; red seal, 2-ton lots, £103 per ton.

Solvents & Plasticisers

Acetone.—Small lots: In 5-gal. cans: 5-gal., £125 10-gal. and upward, £115, cans included. In 40/45 gal. returnable drums, spot: Less than 1 ton, £90; 1 to less than 5 tons, £87; 5 to less than 10 tons, £86; 10 tons and upward, £85. In tank wagons, spot: 1 to less than 5 tons (min. 400 gal.), £85; 5 to less than 10 tons (1,500 gal.), £84; 10 tons and upward (2,500 gal.), £83; contract rebate, £2. All per ton d/d.

Butyl Acetate BSS.—£159 per ton, in 10-ton lots.

***n*-Butyl alcohol, BSS.**—10 tons, in drums, £143 per ton d/d.

***sec*-Butyl Alcohol.**—5 gal. drums £159; 40 gal. drums: less than 1 ton £124 per ton; 1 to 10 tons £123 per ton; 10 tons and over £119 per ton; 100 tons and over £120 per ton.

***tert*-Butyl Alcohol.**—5 gal. drums £195 10s. per ton; 40/45 gal. drums: less than 1 ton £175 10s. per ton; 1 to 5 tons £174 10s. per ton; 5 to 10 tons, £173 10s.; 10 tons and over £172 10s.

Diacetone Alcohol.—Small lots: 5 gal. drums, £177 per ton; 10 gal. drums, £167 per ton. In 40/45 gal. drums; less than 1 ton, £142 per ton; 1 to 9 tons, £141 per ton; 10 to 50 tons, £140 per ton; 50 to 100 tons, £139 per ton; 100 tons and over, £138 per ton.

Dibutyl Phthalate.—In drums, 10 tons, 2s. per lb. d/d; 45-gal. drums, 2s. 1½d. per lb. d/d.

Diethyl Phthalate.—In drums, 10 tons, 1s. 11½d. per lb. d/d; 45 gal. drums, 2s. 1d. per lb. d/d.

Dimethyl Phthalate.—In drums, 10 tons, 1s. 9d. per lb. d/d; 45 gal. drums, 1s. 10¾d. per lb. d/d.

Dioctyl Phthalate.—In drums, 10 tons, 2s. 8d. per lb. d/d ; 45 gal. drums, 2s. 9½d. per lb. d/d.

Ether BSS.—In 1 ton lots, 1s. 11d. per lb. ; drums extra.

Ethyl Acetate.—10 tons lots, d/d, £128 per ton.

Ethyl Alcohol (PBS 66 o.p.).—Over 300,000 p. gal., 2s. 9d. ; 2,500-10,000 p. gal., 2s. 11½d. per p. gal., d/d in tankers. D/d in 40/45-gal. drums, 1d. p.p.g. extra. Absolute alcohol (75.2 o.p.) 5d. p.p.g. extra.

Methanol.—Pure synthetic, d/d, £43 15s. per ton.

Methylated Spirit.—Industrial 66° o.p. : 500 gal. and over in tankers, 4s. 10d. per gal. d/d ; 100-499 gal. in drums, 5s. 2½d. per gal. d/d. Pyridinised 64 o.p. : 500 gal. and over in tankers, 5s. 0d. per gal. d/d ; 100-499 gal. in drums, 5s. 4½d. per gal. d/d.

Methyl Ethyl Ketone.—10-ton lots, £133 per ton d/d. ; 100-ton lots, £131 per ton d/d.

Methyl *iso*Butyl Ketone.—10 tons and over £159 per ton.

***iso*Propyl Acetate.**—In drums, 10 tons, £123 per ton d/d ; 45 gal. drums, £129 per ton d/d.

***iso*Propyl Alcohol.**—Small lots : 5-gal. drums, £118 per ton ; 10-gal. drums, £108 per ton ; in 40-45 gal. drums ; less than 1 ton, £83 per ton ; 1 to 9 tons £81 per ton ; 10 to 50 tons, £80 10s. per ton ; 50 tons and over, £80 per ton.

Rubber Chemicals

Carbon Bisulphide.—£61 to £67 per ton, according to quality.

Carbon Black.—8d. to 1s. per lb., according to packing.

Carbon Tetrachloride.—Ton lots, £79 10s. per ton.

India-Rubber Substitutes.—White, 1s. 5¾d. to 1s. 9½d. per lb. ; dark, 1s. 4d. to 1s. 6¾d. per lb. delivered free to customers' works.

Lithopone.—30%, about £52 per ton.

Mineral Black.—£7 10s. to £10 per ton.

Sulphur Chloride.—British, about £50 per ton.

Vegetable Lamp Black.—£64 8s. per ton in 2-ton lots.

Vermilion.—Pale or deep, 15s. 6d. per lb. for 7-lb. lots.

Coal-Tar Products

Benzole.—Per gal., minimum of 200 gals. delivered in bulk, 90's, 5s. ; pure, 5s. 4d.

Carbolic Acid.—Crystals, 1s. 4d. to 1s. 6¼d. per lb. Crude, 60's, 8s. MANCHESTER : Crystals, 1s. 4½d. to 1s. 6½d. per lb., d/d crude, 8s. naked, at works.

Creosote.—Home trade, 1s. to 1s. 9d. per gal., according to quality, f.o.r. maker's works. MANCHESTER : 1s. to 1s. 8d. per gal.

Cresylic Acid.—Pale 99/99½%, 5s. 10d. per gal. ; 99.5/100%, 6s. per gal. D/d UK in bulk : Pale A.D.F. from 6s. 5d. per imperial gallon f.o.b. UK., 85 cents per US gallon, c.i.f. NY.

Naphtha.—Solvent, 90/160°, 5s. per gal ; heavy, 90/190°, 4s. 10d. per gal. for bulk 1000-gal. lots, d/d. Drums extra ; higher prices for smaller lots.

Naphthalene.—Crude, 4-ton lots, in buyers' bags, £17 5s. to £28 7s. per ton nominal, according to m.p. ; hot pressed, £40 per ton in bulk ex-works ; refined crystals, £56 10s. per ton d/d, mis. 4-ton lots.

Pitch.—Medium, soft, home trade, £9 per ton f.o.r. suppliers' works ; export trade about £10 10s. per ton f.o.b. suppliers' port.

Pyridine.—90/160;, 20/- to £1 2s. 6d. per gal.

Toluole.—Pure, 5s. 7d. ; 90's, 4s. 10d. per gal. d/d. MANCHESTER : Pure, 5s. 7d. per gal. naked.

Xylole.—For 1000-gal. lots, 5s. 10d. to 6s. per gal., according to grade, d/d London area in bulk.

Intermediates & Dyes
(Prices Nominal)

***m*-Cresol** 98/100%.—4s. 9d. per lb. d/d.

***o*-Cresol** 30/31° C.—1s. 4d. per lb. d/d.

***p*-Cresol** 34/35° C.—4s. 9d. per lb. d/d.

Dichloraniline.—4s. 3½d. per lb.

Dinitrobenzene.—88/89° C., 2s. per lb.

Dinitrotoluene.—S.P. 15° C., 2s. 0½d. per lb. ; S.P. 26° C., 1s. 4d. per lb. ; S.P. 33° C., 1s. 2d. per lb. ; S.P. 66/68° C., 1s. 10d. per lb. Drums extra.

***p*-Nitraniline.**—4s. 10d. per lb.

Nitrobenzene.—Spot, 9½d. per lb. in 90-gal. drums, drums extra, 1-ton lots d/d buyers' works.

Nitronaphthalene.—2s. 4d. per lb.

***o*-Toluidine.**—1s. 10d. per lb., in 8/10-cwt. drums, drums extra.

***p*-Toluidine.**—5s. 9½d. per lb., in casks.

Dimethylaniline.—3s. 3d. per lb., drums extra, carriage paid.

Law & Company News

Commercial Intelligence

The following are taken from the printed reports, but we cannot be responsible for errors that may occur.

Mortgages & Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages or Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary but such total may have been reduced.)

J. & H. NICHOLLS (WALSALL) LTD., paint, etc., merchants.—15 October, charge, to Bingley Building Society securing £5,500 and further advances; charged on Abbeylands, Weston-on-Trent. *Nil. 31 December, 1954.

Satisfactions

BRITISH CELANESE LTD., London W.—Satisfaction, 28 October, of debenture stock registered 2 October, 1943, and 8 November, 1944, to the extent of £5,460.

Changes of Name

BERKEFELD FILTERS & WATER SOFTENERS LTD., Sardinia House, Kingsway, London WC2, changed to BRITISH BERKEFELD FILTERS LTD., on 3 October, 1955.

NOBLES & HOARE LTD., Imperial Chemical House, Millbank, London SW1, to HOUSEHOLD PRODUCT RESEARCH LTD.

Increases of Capital

SIMON CARVES LTD., Bird Hall Lane, Cheadle Heath, Stockport, increased by £900,000, in 1,600,000 ordinary shares of 5s., and 500,000 shares of £1, beyond the registered capital of £600,000.

UNICHEM LTD., chemists, etc., 3 Broadwater Road, London SW17, increased by £125,000, in 25,000 six per cent cumulative preference shares and 100,000 ordinary shares of £1 each, beyond the registered capital of £125,000.

L. LEICHNER (LONDON) LTD., manufacturers of cosmetics, powders, soaps etc, 30-32 Acre Lane, London SW2, increased by £4,000, in 4,000 'A' redeemable preference shares of £1, beyond the registered capital of £10,000.

WEST AFRICAN DRUG CO. LTD., 19/23 Stanley Street, Liverpool 1, increased by £50,000, in £1 shares, beyond the registered capital of £25,000.

Company News

Olin Mathieson Chemical Corp.

Sales of Olin Mathieson Chemical Corp. in the US and Canada during the third quarter of this year amounted to $138,340,735, compared with $126,430,834 in the three months ended 30 September last year. US and Canadian sales in the nine-month period ended 30 September 1955 amounted to $409,141,699, compared with $370,598,476 in the corresponding period of 1954. Net income amounted to $12,514,568 in the third quarter of this year compared with $8,179,205 a year earlier; equal to $1 per common share. This compared with 65 cents per share on the smaller average number of shares outstanding in the third quarter last year. For the first nine months of 1955, earnings of the corporation amounted to $32,456,307 compared with $26,730,174 in the same period last year. Sales of foreign manufacturing and distributing operations amounted to $33,793,536 in the nine months ended 30 September, and net income from these activities amounted to $2,829,626.

Powell Duffryn Ltd.

The directors have declared a dividend of 2¾ per cent actual, less tax, on the 3,600,000 4¼ per cent cumulative preference shares for the six months ending 31 December, 1955, payable on January 1956.

Antarctic 'Terylene' Tests

Important uses of Terylene will be tested under the most severe conditions by the Commonwealth Trans-Antarctic Expedition. Sledge ropes, tents, tarpaulins and groundsheets made from Terylene will be tested. All blankets and pillows used by members of the expedition are also of Terylene. The 200 blankets supplied by the manufacturers have been woven from 100 per cent Terylene fibre.

Chemical & Allied Stocks & Shares

UNCERTAINTY has again prevailed in stock markets, and although a rally developed, both British funds and industrial shares moved lower compared with a month ago. War loan 3½ per cent for example is now £76¼, which compares with £80¼ a month ago, but at one time in that period it touched £73½. The dominating factor has been the measures taken to check inflation, which have of course been reinforced by the Budget increases in purchase and profits taxes. In particular, however, the credit squeeze by reduction of loans and overdrafts by the banks is the main factor which is checking spending at home. The credit squeeze is being increased, and the City view is that it may very well remain in force until the April Budget.

Imperial Chemical Unchanged

It was to be expected that chemical and kindred shares would be dominated mainly by the uncertain trend in markets. Imperial Chemical at 47s 1½d were unchanged on balance for the month, and generally movements have been small and indefinite. Earlier falls were mainly regained, and a number of small gains were recorded.

Hardman & Holden 5s. shares eased from 13s to 12s 9d, but Hickson & Welch 10s shares strengthened from 27s 6d to 28s. Brotherton 10s shares were 36s 3d compared with 36s 10½d a month ago, while Laporte 5s shares at 16s 4½d moved higher on balance, allowing for the fact that they are now 'ex' rights to the new issue. Greeff-Chemicals Holdings 5s shares easer to 17s but in other directions, Reichhold Chemicals 5s shares moved up from 17s 9d a month ago to 19s 3d.

Albright & Wilson 5s shares at 19s 1½d were lower on balance, the new issue coming as a surprise, although it is realized that it is to finance the acquisition of Marchon Products and its subsidiary Solway Chemicals—a deal which should add considerably to the scope for profitable expansion. Albright & Wilson will offer to its shareholders 6,084,852 new ordinary shares at 15s 6d each—one for every two ordinary shares now held.

Lawes' Chemical 10s shares have been maintained at 15s 7½d, but Coalite & Chemical 2s shares improved from 3s 9d to 4s. Sharp movements were recorded in Borax Consolidated, which on balance for the month have advanced from 141s 6d to 153s 6d on higher dividend expectations, and the assumption that, if and when more capital is required, it is likely to be raised by an issue to shareholders on favourable terms. Ashe Chemical 1s shares remained at 1s 7d while among plastics shares British Xylonite have been well maintained at 43s 6d and British Industrial Plastics 2s shares firmed up from 5s 9d to 6s 1½d. British Glues 4s shares were good, having risen from 14s 6d a month ago to 15s 9d.

Yorkshire Dyeware & Chemical 5s shares remained at 11s 3d. F. W. Berk 5s shares were 7s 7½d while British Chrome Chemicals 5s shares have been firmer at 11s 3d. Fisons changed hands around 53s 9d xd. Monsanto 5s shares have been active around 27s and William Blythe 3s shares were sold up to 14s 1½d. Triplex Glass 10s shares at 39s 3d were virtually the same as a week ago. Unilever have moved up from 87s 9d to 89s 6d, while the 4s units of the Distillers Co. gained a few pence from 23s 7½d to 24s 1½d. Glaxo 10s shares were firm at 30s following the full results and chairman's annual statement. Oil shares displayed a good deal of activity. Shell rose on the month from 123s 1½d to 135s 7½d and BP were 108s 9d compared with 100s 7½d a month ago.

UK Instruments in US

FOURTEEN UK instrument firms specializing in the nuclear energy field will be exhibiting some of their latest instruments on an official stand taken by the Board of Trade at the International Atomic Exposition in Cleveland, Ohio, from 10 to 16 December. The main object of the display, which has been organized with the co-operation of the Scientific Instrument Manufacturers' Association of Great Britain, is to promote the sale in the US and Canada of UK nucleonic instruments. Exhibits on show will range from instruments of measurement and detection to nucleonic controllers used in industry. The stand will be staffed by the American and Canadian agents of most of the UK exhibitors and three technical experts from the UK.

Next Week's Events

MONDAY 28 NOVEMBER

The Chemical Society

Durham: The Science Laboratories, South Road, 5.15 p.m. Joint meeting with Durham Colleges Chemical Society. 'Some New Results Obtained by the Method of Flash Photolysis' by Professor R. G. W. Norrish, D.Sc., F.R.I.C., F.R.S.

Oxford: The Physical Chemical Laboratory, South Parks Road, 8.15 p.m. 'Why Polymerization Occurs' by Professor F. S. Dainton, M.A., Ph.D.

SCI (Pesticides Group)

London: Rooms of the Chemical Society, Burlington House, Piccadilly W1, 5.30 p.m. 'The Control of Parasitic Weeds' by K. Wilson-Jones, B.Sc., M.Sc.

TUESDAY 29 NOVEMBER

Society of Instrument Technology

London: Manson House, Portland Place W1, 6.30 for 7 p.m. 'Electronic Computing Methods' by A. St. Johnston, B.Sc., A.M.I.E.E., A.C.G.I.

The Textile Institute

Bradford: Midland Hotel, 7.15 p.m. 'Experiences in Australia' by F. Happey, Ph.D., B.Sc., F.Inst.P.

RIC (London Section)

London: Sir John Cass College, Jewry Street EC3, 6 p.m. 'Gas-Liquid Chromatography' by A. J. P. Martin, M.A., Ph.D., F.R.S.

Society for Analytical Chemistry

London: The Beveridge Hall, University of London, Senate House, Malet Street WC1, 7.30 p.m. 'The Developments of Polarographic Analysis' by Professor J. Heyrovsky, D.Sc., Ph.D., of the Central Institute of Polarography, Prague.

WEDNESDAY 30 NOVEMBER

RIC (London Section)

London: South West Essex Technical College, Forest Road, Walthamstow E17, 7 p.m. 'Fluorocarbons & Their Future' by R. N. Haszeldine, B.Sc., Ph.D., M.A.

Society for Analytical Chemistry

London: The meeting room of The Chemical Society, Burlington House, Piccadilly W1, 6.45 p.m. Annual general meeting of the Physical Methods Group followed by lecture: 'Atomic Energy & the Analyst' by A. A. Smales, B.Sc., F.R.I.C.

Institution of Chemical Engineers

London: Institution of Civil Engineers, Great George Street SW1, 2.15 to 8.15 p.m. Inaugural meeting of the British Nuclear Energy Conference. Lectures: 'The UK Atomic Energy Project' by Sir John Cockcroft, K.C.B., F.Inst.P., F.R.S.; 'The Place of Nuclear Energy in UK Power Development' by V. A. Pask, C.B.E., M.I.E.E., M.I.Mech.E., & J. C. Duckworth, B.A.; 'The Use of Research Reactors in Nuclear Power Development' by H. J. Grout, B.Sc., A.M.I.Mech.E.; 'Health & Safety in a Nuclear Power Industry' by A. S. Maclean, M.B., Ch.B., D.I.H., & W. H. Marley, M.Sc., Ph.D.

Manchester: The Reynolds Hall, College of Technology, 7 p.m. 'Combustion in Particulate Systems' by L. Cohen, Ph.D., D.I.C., A.Inst.P.

Royal Society of Arts

London: John Adam Street, Adelphi WC2, 2.30 p.m. 'The Scientific Aspects of the Detection of Crime' by L. Nickolls, M.Sc., A.R.C.S., D.I.C., F.R.I.C.

Institute of Physics

Sheffield: The University, 3 p.m. 'Nuclear Reactors—Types & Fuels' & 'The Economic Production of Nuclear Power' by P. W. Mummery.

THURSDAY 1 DECEMBER

The Fertiliser Society

London: The Geological Society, Burlington House, Piccadilly W1, 2.30 p.m. 'Product Control in Fertilizer Manufacture' by Dr. D. Williams, M.Sc.

SCI (Chemical Engineering Group)

Bristol: Chemical Department, The University, Woodlands Road, 7 p.m. 'The Technology of Carbon & Graphite' by J. M. Hutcheon.

SCI (Microbiology Group)

Manchester: The University, 6.30 p.m. 'Recent Developments in Fungal Biochemistry' by J. H. Birkinshaw, D.Sc.

Society for Analytical Chemistry

Glasgow: Central Station Hotel, 7 p.m. Ramsay Chemical Dinner.

Society of Instrument Technology

Middlesbrough: Cleveland Scientific & Technical Institution, Corporation Road, 7.30 p.m. 'The Influence of the Electrical Medium on Instrumentation & Control in

Industry' by W. Marchment (Evershed & Vignoles).

The Chemical Society

Bristol: The University, 7 p.m. 'The Manufacture of Phosphoric Acid' by J. I. Porter.

Sheffield: Department of Chemistry, The University, 7.30 p.m. 'Directing Effects in Inorganic Substitution Reactions' by Dr. J. Chatt, M.A., F.R.I.C.

London: Lecture Theatre, Royal Institution, Albemarle Street W1, 7.30 p.m. 'Reactions of Radicals in Gaseous Systems' by Dr. E. W. Steacie, O.B.E., M.Sc., F.R.S.

FRIDAY 2 DECEMBER

The Chemical Society

Glasgow: Royal Technical College, 7.15 p.m. 'Studies of the Molecular Basis of Biological Motility: or How to Swim with only a Molecule for a Tail' by Professor W. T. Astbury, M.A., Sc.D., F.R.S.

Society of Instrument Technology

Fawley: Copthorne House, Fawley, Hants, 7 p.m. 'Future Trends in the Oil Industry' by J. E. Jeffers, B.Sc.

Oil & Colour Chemists' Association

London: Criterion Restaurant, Piccadilly W1, 6.45 for 7.30 p.m. Annual dinner and dance (Ladies' Night).

SCI (Newcastle Section)

Newcastle-on-Tyne: Royal Turks Head Hotel, 7 p.m. Joint function with the Royal Institute of Chemistry. Annual dinner & dance.

Antibiotics Research

Washing Machines Being Used by ICI

EIGHT Hoover washing machines are being used in the Akers Research Laboratories of ICI Ltd. at the Frythe, Welwyn, Herts, for the experimental cultivation of antibiotics producing moulds. These moulds and their experimental products may be used for studying and combating diseases of human beings, animals and plants.

The idea of employing washing machines for this work first occurred to the research staff some four years ago and one was obtained for trials to see whether it would fulfil the needs of the work. Briefly, the problem was to stir constantly and aerate the solution in which the moulds are grown. The first machine, as adapted by ICI, proved satisfactory. It has now been run for some 7,000 hours, a period equal to about 70 years' domestic use. It is still running, together with seven other Hoover washing machines adapted for this purpose.

The eight machines are housed side by side, together with other necessary apparatus. Their adaptation to their new purpose consists of connecting an air inlet pipe to the normal drainage outlet and of affixing a special lid, which has five holes in it. Two of these are to provide for the circulation of water to a small heat exchanger immersed in the solution in the washing machine tub, to maintain it at a constant temperature. One hole is for filling the tub with the solution of sugar, ammonium nitrate, phosphates and other food materials on which the mould is grown. There is another access available in the lid so that samples may be taken during the experiment and another hole is used to carry a glass pipe down to a bucket as an air exit and to carry off any overflow of 'froth'.

The heat exchangers of pairs of washing machines are supplied with a flow of constant temperature water from a large thermostat. There is other apparatus to supply the sterile and humidified air.

Seven different moulds have been grown in the machines since they were adapted and the use of the machines is said to have resulted in an eightfold increase in the average yield of a particular antibiotic whose production has been investigated in the laboratories.

Developing Propane Plants

Canadian Hydrocarbons have recorded a net profit of $71,687 for the first half of this year. Formed at the beginning of the year the company had a working capital of $2,864,849 at the end of June. By the end of this year the company will be operating 29 propane plants in Western Canada, which will be increased to 47 by 1957. In addition, work is going on in the development of a products pipeline from Alberta to Winnipeg, Manitoba, a potash mine in Saskatchewan, and a fertilizer plant in Manitoba.

Gifts to University

The Council of Leeds University announced on 17 November that it had received from the Wool Textile Research Council gifts of £10,000 for the department of textiles and £900 for research in the department of colour chemistry.

CLASSIFIED ADVERTISEMENTS

SITUATIONS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive, or a woman aged 18-59 inclusive, unless he or she, or the employment, is excepted from the provisions of the Notifications of Vacancies Order, 1952.

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QUALIFICATIONS: Honours degree in Physics and/or Chemistry or equivalent qualifications and fundamental knowledge of electro-chemistry and thermo-dynamics to undertake metal corrosion research, experience in which is desirable.

CONDITIONS: Permanent appointment to the Postmaster-General's Department. Free passages for appointee and dependants. Initial accommodation arranged. Full salary from date of embarkation. Superannuation, annual and sick leave conditions.

PERSONS ELIGIBLE: British subjects under 51 years of age with suitable qualifications.

APPLICATIONS: To the Australian Post Office Representative, Australia House, Strand, W.C.2, by 31st December, 1955.

CHEMIST with college training and some years industrial experience required for interesting and progressive Works appointment with important Tyre Manufacturer in the London Area. This offers an assured future for a man seeking a progressive career. Conditions are good, there is a pension scheme and other amenities. Apply **BOX No. C.A. 3439, THE CHEMICAL AGE, 154, FLEET STREET, LONDON, E.C.4.**

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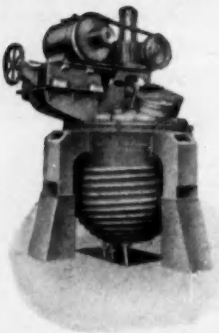

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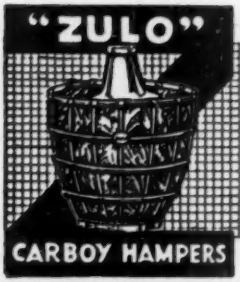

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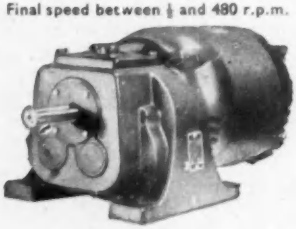

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INDEX to advertisers in this issue

	Page
Audley Engineering Co., Ltd.	1136
Bowmans Chemicals Ltd.	1181
Ciech, Ltd.	1138
Cole and Wilson	1180
Cyanamid Products Ltd.	1141
Classified Advertisements	1178, 1179, 1180
Dryden, T., Ltd.	Cover ii
English Glass Co., Ltd. (The)	1142
Farwig, J. F. & Co.	1146
Feltham, Walter H. & Son Ltd.	1181
Haughton's Metallic Co., Ltd.	1180
I.C.I., Ltd. (Billingham-Organic Chemicals)	Front Cover
Industrie Chimiche	1143
James Wilkinson & Son Ltd.	Cover iii
Jones, Tate & Co., Ltd.	1182
Kestner Evaporator & Engineering Co., Ltd.	1140, 1180
Leeds & Bradford Boiler Co., Ltd.	1180
Leigh & Sons Metal Works Ltd.	1180
Manlove, Alliott & Co., Ltd.	Cover iv
Neckar Water Softener Co., Ltd. (The)	Cover ii
Nordac Ltd.	1135
Paterson Engineering Co., Ltd.	1146
Power-Gas Corporation Ltd. (The)	1177
Pyrethrum Board of Kenya (African Pyrethrum)	1144
Sandiacre Screw Co., Ltd.	1181
Simon, Richard & Sons, Ltd.	Cover ii
Stanley Engineering Co.	1180
Towers, J. W. & Co., Ltd.	1139
Unifloc Ltd.	1142
Whiffen & Sons Ltd.	1137

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